The Iron Age

A Review of the Hardware and Metal Trades.

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Gang Saw Improvements.

We extract from the Moniteur Industriel Belge the annexed engraving of a new gang saw, manufactured by M. Arbrey, of Paris. The machine, which appears to be of very simple, and, doubtless, effective, construction, is composed of two heavy standards of cast iron, joined above by a crosspiece, and bolted below to a heavy bed of stone. Between the standards vertically travels a frame which carries the saw blades, and to which a reciprocating motion is tached to pulleys fast upon an arbor passing through the lower parts of the supports. The the engine, and the other carries eccentrically with a rachet wheel, by means of which the log is carried against the saws.

ng, the arrangement of which is such that the blades are allowed to traverse the entire dength of the work without necessitating the readjustment of the latter. The carriage is provided with traction hooks which, when the former is in any position, engage with an endless chain. This chain is actuated by a cog wheel, not shown, connecting with the ratchet wheel, and completes the mechanism for driving the carriage.

Any number of saws may be attached to the frame by the usual means, and so that trunks of the largest diameter may be divided into as many boards as desired, all of which, by suitable adjustment of the spaces between the blades, may be of uniform thickness.

The Great Coal Land Case .- The Philadelphia Ledger says: A curious hisory is given of James umbull, the plaintiff in the great coal land suit in this State, which the courts reently decided against him, and the case itself presents some sinrular features. The and was the property of the Turnbulls for ears previous to the development of the coal mines of Pennylvania. Jas. Turnull, father of the plaintiff, seems

have been the last one

of that family in

whom the title vested.

for arrears of taxes, under the laws of the State, and came into the possession of the Pardees, Packers and other wealthy opering a son and a divorced wife. Some time after the death of Turnbull, the son went to sea. In 1852, Mrs. Turnbull, believing that, if living, er son was the legal owner of the lands in Lune county, they having become of unlimited lue by the discovery of coal upon them, came Manch Chunk to try and ascertain if there as any foundation for her belief. O. H. heeler, then a lawyer of the place, became insted in the case and was confident that the in on behalf of young Turnbull was good. was of great importance that he should be wand, however, before proceedings in ejectent against the holder of the property should nence. Nothing had been heard of the wanerer for years. All effort to get trace of him le was summoned home, arriving here in the ng of 1872.

the end of that time Turnbull alone was alive. thermore is interposed between the burners and of the fearful voyage, and he then proceeded to work the wick adjusting devices in such manner Central America, and, in the gold excitement of as to prevent the flame of the burners from years, and then went to Mexico. On his way to of the oil receiver is made of such size and so plosion; and was one of a few out of the hun- hole, through which the wicks, if for any readreds on board who was saved. Reaching Ma- son dropped from the wick tubes, may be rediers, who broke into his ranch, and left him for mitting their ready removal when desired. ground. He recovered from these wounds, and wick tubes, and below the system of chimneys, a second connecting rod, which communicates succeeded, aithough surrounded by dangers of said plate is furnished with an upward projectple contrivance shown on the left of the engrav- cating liquors or gamble, he believes he would of heat from the chimney to the aforesaid plate. specimens of the powder and of the water to ward an extension of 60 feet was added, mak-

He was three months recovering from the effects the openings in the wick tubes, through which 1849, joined one of the bands going to the new Eldorado. He remained in California some below the top of the wick tubes. The oil inlet Mazatlan he was blown up in a steamboat ex- arranged that it serves the purpose of a hand zatlan he took a contract in a canal that was covered. Fixed lugs are provided to pass being built there, and was in constant danger | through slots in the base plate of the system of imparted by means of two connecting rods at- of being murdered. He was robbed several chimneys for the burners, thereby retaining the State Assayer of Masachusetts, cites a circum- municates with the Eric Railroad at Binghamtimes, and once beset by a gang of Mexican sol-said chimneys in position for use and yet perpulley at one end receives motion by a belt from dead, with twelve daggers pinning him to the foraminated plate being provided around the all kinds, in making considerable money. But for a resolution he made when he commenced chimney without permitting such contact upon the lining, and the owners, fearing that The last is a two story brick building. The The log is dogged to the carriage by the sim- his wild manner of living, never to drink intoxi- thereof as would permit the rapid conduction the water might be rendered deleterious, sent rolling mill was originally 150 feet long. After-

clamped against the ends of the chimneys by this respect. The Eric Canal and New York

Corrosion of Tin.

to change of all our common metals; but a secures to it direct communication to Oswego, stance which appears to be wholly contradic- ton and the coal regions at Scranton. tory to such a theory. A tank, belonging to a hotel in Collinsville, Conn., was lined with iron from 1/4 inch to 3/4 inch; square, from 1/8 block tin containing less than 2 per cent, of im- to 5 inches; and flat, 1/4 to 21/4 inches. The purities. Some time after the construction of works consist of three buildings, the rolling

suitable bolts, holding the whole together so Central Railroad connects it with all Eastern that the system of chimneys may be placed and Western points, and the Black River Canal, bodily in proper relation to the series of wick which joins the Erie Canal at this point, affords communication with Boonville and the intermediate country. The Rome, Watertown and Ogdensburgh Railroad connects it with various ports on Lake Ontarlo and the St. Lawrence Tin is generally regarded as the least liable and with Canada. The New York Midland case, recently reported to the American Academy of Arts and Sciences, by Mr. S. R. Sharples, Delaware, Lackawanna and Western it com-

The principal products of the mill are round

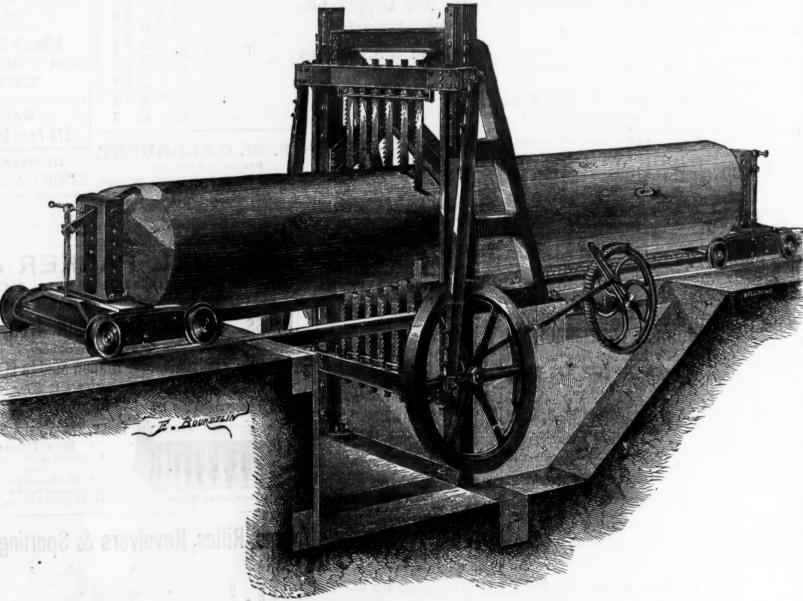
ing the total length 210 feet. The original building was then increased in width by 25 feet. An extension was built from the front for the machine shop measuring 40x 25 feet. The scrap shed is a wing 40x60 feet in dimensions.

The rolling mill contains three heating furnaces, it also contains four single and one double puddlirg furnaces. There are two trains of rolls, an 18 inch train, puddle train, and a 9 inch finishing train. The puddle train is also used as a finishing trein. Each train comprises three stands. One of Dudgeon's four ton steam hammers is used in shingling the puddled iron. A crocodile squeezer is also kept ready for use, but is only employed when the hammer fails. Eight boilers are used in the works, two of which are placed on the ground, and the remainder suspended over the furnaces on mantels supported by pillars. The heat is communicated to the boilers through leaders two feet in diameter. In addition to these there is one auxiliary boller which is only used in cases of emergency. The boilers vary in length from 20 to 26 feet, and in diameter from 31/4 to 4 feet. Four of the furnaces cate with one stack which is 8 feet square at the base and 75 feet high. The

belts. A 24 inch belt imparts the motion of During the month of March last, an interval the main shaft to a counter shaft, which conbore of the cylinder is 24 inches and the stroke machinery in other portions of the works. It

The mill is well supplied with other machinery. Three shears are used; one in the scrap shed for cutting scraps, another for outounted for, as the weight of present authority ting billets, and the third for trimming the finished iron. A large derrick is used in maninulating heavy masses, and overhead tracks connect the various heating furnaces with the rolls. The machine shop is supplied with planers, lathes, etc. The warehouse is detached from the mill, but a track runs from one building to the other. The works employ about 75 meb.

> The Champion Bar and Knife Co, of Springfield, O., with a capital stock of \$200,000, for



ARBREY'S IMPROVED GANG SAW.

When he arrived in this country the proceedings in the case were commenced in earnest. It came up for hearing about a year ago, but was ators in this coal region. James Turnbull postponed on motion of defendants' counsel, had died in Philadelphia years before, leav- and came up finally last month. The case gave rise to very nice points of law, but everything hinged in the act governing the sale and redemption of land sold at treasurer's sale, for arrears of taxes, which was clearly in favor of the defendants. Whether the case will be carried further is not known.

Cooking, Lighting and Heating with

Liquid Fuel. Mr. J. H. Johnson, of Lincoln's-Inn-Fields, England, has recently invented an apparatus which combines cooking with lighting and heating by means of liquid fuel. In the construction of the apparatus one or more troughs communicating with a suitable reservoir are arranged to confine a volume of water in conwed unavailing for twenty years, when he tast with the wick tube or tubes of the as heard of, accidentally, in Mazatlan, Mexico. burners in such manner as to maintain the same at a comparatively low temperature, and thereby prevent the heating of the oil below The career of James Turnbull had been one of and all danger of evil results therefrom. The il, hardship and adventure. The vessel in volume of water is moreover provided in such which he left Philadelphia was shipwrecked, and relation with the chinmeys of the burners that and eight others of the crew floated nine days the aqueous vapor rising to the flame increases,

power, retard the lateral transmission of heat, the chimneys as required for cooking purposes, while from the transparent character of the mica, the light is permitted to pass laterally and of nearly two years having clapsed since the neets with the rolls by means of two 18 inch for heating purposes a radiator is placed over or apartment in which the apparatus is placed. When used for simultaneously baking and steam cooking, a steam generator formed with passages coincident with the tops of the chimneys is supported above the latter, and upon this steam generator is placed an oven, the steam from the generator being conducted through a pipe to a suitable chamber separately provided, and the contents of which are cooked by the steam at the same time that the contents of the oven are cooked by dry heat communicated from the hot currents from the chimneys passed to the passages in the steam generator. the heating of the oven being also facilitated by its immediate contact with the said generator. The system of chimneys are placed with their lower ends resting upon a base plate cast with a series of cones and their upper ends against a an open boat on the ocean. This boat was as has been found by experiment, the intensity top plate, having openings coincident with the facilities in receiving crude materials and ship-the purpose of making reaper knives, finger leading products. Rome is especially favored in bars, &c., has been incorporated.

He, it appears, neglected it, and it was sold never have lived to return to his native land. The chimneys have their sides formed of plates Mr. Sharples for analysis. The white powder in diameter. A single horizontal engine of mica, which, from their low heat conducting proved to be exide of tin with a mere trace of drives both trains. The puddle train is on iron, and the water, which was led to the tank a line with the engine shaft and is geared and thereby insures its passage upward through through 100 feet of lead pipe, was entirely free directly to it. The smaller train is driven by from the latter metal.

> be availed of in the same manner as lamp or above examination, and the tank lining being belts. The engine has 250 horse-power; the candle light. When the apparatus is to be used some five years old, the proprietors called Mr. Sharples' attention to the fact that the lining 36 inches; the fly-wheel is 20 feet in diameter the chimneys, and heated by the hot currents had become perfectly riddled by corrosion, and and weighs 20 tons. Another engine is emissuing from the tops thereof, warms the room this although there had been a free and con- ployed to drive the machine shop and the stant circulation of fresh water, an analysis of which showed even better results than before. is a 40 horse-power engine and has a 26 inch There were 4.20 parts of inorganic matter and stroke. Its belt is 10 inches wide. 0.80 parts of organic matter in 100,000, and no nitrates were present.

> > This extensive corrosion can hardly be acpoints strongly to the unalterability of tin under similar circumstances.

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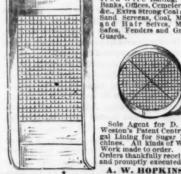
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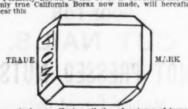
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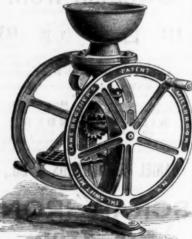
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These works are situated in the town of Clin ton, about 10 miles south of Utica. The Chenango Canal flows by the property, and affords water communication with Utica on the north, and thence by the Erie Canal cast or west, and with the coal regions on the south. Branches of the New York and Oswego Midland Railway connect the works with Rome and Utica, at which points they are in direct communication with Syracuse, Oswego, Rochester, Buffalo, and first products, the manufacturers, and the purother points on the west, with Canada by the R. W. and O. R. R. on the north, and with New York and Boston on the east. On the south it connects with Binghamton and Scranton by railway. The works have a track extending from the railroad into the stockhouse, so that whatever ore or coal comes by rail may be unloaded as near the foot of the elevator as may be desired. The track is placed on a trestle work in the stock house, and the process of unloading is thereby made very simple. Most of the coal is brought by the canal, and is hoisted from the boat by a steam engine and placed in cars, which are then run into the works,

The ore used in the furnaces is obtained nostly from the company's own ore beds, which are situated at from 21/2 to 5 miles from the works. The ore is brought in wagons from the beds and weighed at the company's scales before it is dumped. The company own all the ore on 1000 acres. It is fossiliferous in its character, and the officers claim that it will y'eld 47 per cent. of iron at the furnace. The beds have been worked for 23 years. The ore forms 60 per cent, of the furnace mixture, the remaining 40 per cent. being made up half of Jefferson county ore, which runs about 55 per cent. fron at the furnace, and Lake Champlain, which yields about 65 per cent. The limestone is obtained about 21/2 miles from the furnace, and costs, when delivered at the works, only 86 cents per

Furnace No. 1. was built 23 years ago, and was originally only 42 ft. high. It was built of stone. In 1869 they added 12 ft. to its hight, and made various changes in its construction: a portion of the masonry has been taken away in front, and an arch, supported by two iron columns, has been substituted. In the same year No. 2 was built. It is also 54 ft. bigh The furnaces are each 14 ft. wide at the bosh, and the boshes are each 22 ft. high. No. 1 has six tuyeres, arranged in pairs in three separate arches. No. 2 is an iron stack and rests on a mantel supported by iron columns. It has five tuyeres. The casting house is about 75 ft. square. A 3-foot track has been laid in the casting house, and separates into two branches, each of which goes to a furnace. The cinders and slag are shovelled into the cars and then run out. The stock house is 100 ft. square, and has an addition, which is used as a coal shed, and is 125 ft. by 50 ft. in dimensions. Both stacks are capped with bell and hopper, and the materials are raised to the top by Otis' elevators. The lift is 54 ft. The furnaces are connected together at the top by a gallery, which is roofed and entirely enclosed by sheet iron walls.

There are two heating ovens, each of which has 48 pipes. The gas supply pipe is 4 ft. in diameter, and the ovens are disposed each behind and near to its furnace. The blowing engines are horizontal condensing engines, and are located in a brick building detached from the rest of the works. Each is of 250 horse power, and the stroke in both cases is 10 ft. The bore of the steam cylinder is 38 inches, and of the blast cylinder 88 inches. The blower is Knowles' patent, and drives 5000 cubic feet of air per minute. The surface condensers are outside of the engine house. Although this is a limestone country, no trouble is experienced from boiler scale on account of the use of condensed steam. Five of Knowles' pumps are placed in the engine rooom, four of them being grouped together between the engines and the fifth in another portion of the room. Two of them are boiler pumps, one for each boiler, a third is the furnace pump, another is a vacuum pump, and the fifth is a spare pump ready for emergencies.

The wrought iron air receivers are each 5 ft. in diameter, and are placed in a vertical position over the blast cylinders. The boiler for engine banks. Each bank has 70 sections, and in both boiler is placed in a separate and detached brick building, and the smoke stack for the furnaces of these boilers is 85 ft. high, and is 5 ft. square at the base. It is braced on all sides by tension

During the winter both stacks were refitted. the 24th of May. The company are now making 350 tons of iron per week, and run out once mostly Nos. 1 and 2 fron, principally No. 1. They have at present but little stock on hand, and are employing about 90 men. Among the other accessories to the works is a grocery and supply store, owned by the company.

The Association of German Iron Masters

A meeting of iron masters of Silesia, West phalia, of Nassau, and the districts of the Rhine, was held in December last, with the object of forming a union of German iron mas ters. A committee was formed, with authority to form rules for the association.

At a second meeting, which took place a Berlin in March, the rules were presented and accepted. The union has addressed a circular to all the iron masters in Germany, in which the objects for which the association has been formed are explained as follows:

1st. To take charge of all legal proceedings. as well in the empire as in other countries.

2d. To watch to a favorable conclusion all treaties of commerce and of navigation.

3d. To demand the completion of roads of ommunication, the keeping up of their work ing condition, and the cheapening of tariffs. 4th. To regulate the relations between capital and labor.

5th. To establish rules to facilitate the rela tions and transactions between the suppliers of chasers of the finished products.

Stove Founding in Utica, N. Y.

The stove manufacturing interest in Utica is represented by two foundries, that of Messrs J. S. & M. Peckham, and that of Mr. Russel Wheeler. The office of the Messrs. Peckham is located at Nos. 22 and 24 Catharine street, Utica. The foundry occupies a block, bounded by Broad, Third and Catharine streets, and a basin of the Eric Canal. The specialty of this firm is a stove known as the "Modern Popular Cook." The advantages claimed for it are its clinkerless grate, illuminated mica front, ash pan and sifter, and oven. The mica door is placed below the top of the grate instead of above it. The mica windows are thus kept from becoming smoked and discolored. The advantage claimed for the ash pan is that it affords a greater accomodation for the ashes than has hitherto been provided. This advantage is obtained by not allowing the oven to extend under the grate, the manufacturers claim ing that such a portion of the oven is of no use The stove is provided, in addition to the cold air draft, with a hot air draft. The latter is placed at the top and in front of the front fire box plate, which is the hottest plate of the store. The air to feed the fire strikes this plate and beomes heated, and is then carried to the bottom of the fire box, and enters the space below the fire. It then passes up through the fire, and being heated; it is claimed that a more perfect combustion is produced. This firm also manufactures many wood stoves. They make also an agricultural furnace, in which the flues are so constructed that the whole surface of the cauldron may be heated at the same time. It is portable, and may be used in or out of doors. The concern also manufacture cultivator teeth and shovel plow blades.

The works comprise a brick building con sisting of three stories and basement, situated on the corner of Broad and Third streets, with a front of 40 ft. and depth of 80 ft.; the foundry ! building measuring 75 ft. by 100 ft., occupying the corner of Broad and Catharine sts.; and a smaller building back of these containing the engine and boiler rooms, the japanning room and tumbling room. Beside these there are several wooden sheds for storing castings, The concern employs 75 men. Three stories of the main building are occupied as store rooms for stoves. At the end of this bullding is an extension 20x40 ft., one story high, in which the cultivator teeth are made. Here are presses for giving the teeth the proper shape, and a Peck drop hammer. This portion of the business extends over six months of the year, and during that time keeps four men employed, The basement of this building is occupied as a mounting shop. Another mounting shop is in an adjoining wooden building.

The engine is horizontal, of 20 horse-power The bore of the cylinder is 12% inches, and stroke 3 ft. The japanning oven in the room next to the engine room is 6 ft. long by 4 ft. in width, and 7 ft. in hight. Back of the engine room is the tumbling room, in which are four tumbling barrels. The foundry cupola is a Mackenzie, and is built outside of the foundry wall to shield the men from the heat, and the iron is conveyed up to the cupola by means of a long inclined plane. For foundry purposes this concern uses Lehigh pig mixed with iron from the Franklin Iron Works, of Clinton, and the Jaggar Iron Works, of Albany.

Mr. Russel Wheeler's foundry is situated at 70 and 72 Columbia street, Utica. He claims pecial advantages for his stoves from the fact that he uses a great deal of Scotch iron in their composition. His principal stove, is the "Nonpareil." He claims for this stove the follow No. 1 is of wrought iron. It consists of 12 ing advantages: It is provided with a hot blast shells, six of which are 50 ft. long and 36 in. in draft, it takes the air through a damper in front diameter, and six are 45 ft. long and 30 in. in directly against the front fire plate, through diameter. Engine No. 2 has a cast iron boiler, flues down into the air chamber, thereby supbuilt on Mill's patent, and comprising two plying the grate with hot air. It has also a gas and smoke consumer, arranged as follows: banks together there are 3000 square ft. of heat- Side flues supply with air a perforated plate ing surface. It works very satisfactorily. Each directly in the rear of the fire box and on a level with the top of the fire, thus bringing the air in contact with the coal gas, creating a flame, and, it is claimed, saving fuel. It is also provided with a reservoir made of copper, or of cast or galvanized iron, with patent flues, so that if it is necessary, by drawing a damper, the No. 1 blew in on the 9th of March and No. 2 on fire can be thrown directly in contact with the reservoir by passing through the patent flues. Otherwise the water may be heated the same as every eight hours. They are now making in ordinary reservoirs. The manufacturers claim for the stove that its oven is more than usually capacious. The No. 9 oven is 22 inches ong, 23 inches wide, and 151/2 inches high.

The works have a frontage of 158 ft. on Columbia street, and are 150 ft. deep. The main building is three stories high, the foundry one story. The pattern shop and pattern store room are located in a brick building entirely detached from the rest of the works, for safety,

The pattern building has lately been raised one story. On the first floor of the main building is a room for storage and shipping, a fitting and granding shop, and a tumbling room. A square barrel is used for tumbling the larger castings, and two cylindrical barrels for the smaller castings. The two floors above are used entirely for fitting, packing and storage, the upper one being especially devoted to the first-class stoves. The molding room is 80 by 60 ft. in dimensions, and the cupola has a capacity of five tons. The engine is of the horizontal order, and has 10 horse-power. A pressure blower is used. The pattern building has lately been raised

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This invention relates to a new process for containing phosphorus, sulphur, silicium and senic, may be purified and utilized.

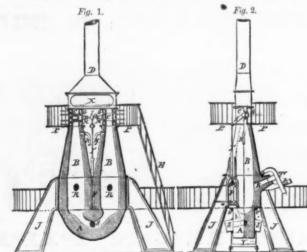
in the Bessemer or similar apparatus, or in phosphorus (as an example) to a state in which reverberatory or other furnaces, been capable it will contain three kilograms, so that the of transformation into malleable steel suitable crude metal can afterward be transformed into to be rolled. This invention consists, first, in excellent ternary steel in a reverberatory furan improved alloy of iron and phosphorus, by nace means of which is produced a new material, containing very !ittle or no "active" carbon, which is called "phosphoric steel;" second, in crude metal produced in the aerodynamic apan improved alloy of iron, phosphorus, and paratus. manganese; third, in the process of converting the various ores and varieties of iron contain- arsenic, as well as those which contain silicium, ing a minimum quantity of phosphorus into sulphur and phosphorus, cannot be completely phosphoric iron or steel; fourth, in the process transformed into malleable steel in the aerodyof converting the varieties of iron and ores con- namic apparatus, because the employment of taining a maximum quantity of phosphorus reagents in a great part volatile causes a gradinto phosphoric steel by the introduction of ual cooling of the metallic mass, which bemanganese during the process of melting; comes less and less fluid toward the end of the fifth, in the employment of certain reagents, hereinafter specified, for the formation of a that the purified metal should be poured at the flux to absorb and combine with the silicium, sulphur, &c., and remove the same and other metal, or iron, to the state of crude metal, or impurities from the metal; sixth, in a new and steel. improved apparatus for carrying my invention The crude metal thus obtained is easily reinto effect, which may be called an aerodynamic fined. After cooling, it can be remelted in a

the alkaline nitrates or earthy alkalies. These terior of which assume a cylindrical form eagents, employed separately, have upon the The upper ends of the tubes B are provided metals to be purified but an incomplete action; at Washington the following specifications of but, if fused together, or simply mixed in the serve either to close the columns or for the certain patents lately issued, which will be proportions hereinafter described, they act with great efficiency.

proportions as indicated, act well, viz. : calcic oxyfluoride, one part; chloride of sodium and No. 150,546, dated May 5, 1874, isssued to hypochloride of lime, one part; alkaline nithe hight of the columns. The apparatus rests Cyprien Marie Tessie Du Motay, of Paris, trates, three parts. Of this composition, according to the hight of the columns. The apparatus rests trates, three parts. ing to the nature of the metals to be purified, variable quantities may be taken, but whatever the manufacture of iron and steel, by means of may be the proportions of phosphorus and arwhich the ores of iron or plg, cast or old iron, senic contained in the said metals, it is sufficient to employ fifty kilograms of the said mixture to bring the "crude" metal produced with Heretofore these varieties of iron have not, one ton of iron containing fifteen kilograms of

> A reverberatory furnace is used in the ordinary manner, to complete the refining of the

> The metals combined with phosphorus and operation. Experience has demonstrated to me moment when it passes from the state of "fine"?



IMPROVED APPARATUS FOR MAKING STEEL.

purifier, as will be more fully hereinafter de- | reverberatory furnace in the same manner as in scribed.

The reagents employed operate on one hand silicium contained in the ores or fron to be phorus and convert the metal directly into the phosphoric steel, if the amount of phosphorus in the metal does not exceed from two-thou- bined. sandths to five-thousandths; or into an alloy containing four-thousandths of phosphorus, if the proportion of phosphorus in the metal to refined should exceed five-thousandths, which alloy is utilized in the manufacture of phosphoric steel by a subsequent process, as

will be described. When the metals to be purified do not contain more than five-thousandths of phosphorus, they are submitted as they are, without the addition of manganese, to the oxidizing action of compressed air, and of the purifying agents hercinafter specified. If the proportion of ufacture of rails. In one word, quarternary phosphorus exceed five-thousandths, according steel containing iron, manganese, carbon, and to the nature of the minerals from which the phosphorus obtained in a reverberatory furnace metals are extracted, then, during the melting cannot be welded or rolled. of the iron in the blast furnace, mix with it a quantity of manganese, equal at the minimum to two and a half per cent, of the weight of the may be used for combining with the decarsaid iron, which will eliminate any silicium and bureted metal. For this purpose twenty kilo and reduce the amount of phosphorus to such an extent that the metal can be subsequently transformed into the phosphoric steel. In case the irons to be purified cannot be prepared, as above stated, in the blast furnace, they are transformed into "fine metal" in the aerodynamic apparatus, two per cent. of manganese is added. This combination, subsequently treated in a puddling furnace, will give most free from phosphorus and arsenic. This nost chemically pure iron is remelted in a reverberatory furnace, with crude metal, or the metal containing more than four-thousandths of phosphorus, in such proportion that the

the Martin-Siemens process. By the oxidizing action of the flame, in connection with the to wholly eliminate the sulphur, arsenic, and oxides of iron or manganese employed in successive parts, the crude metal is rapidly transtransformed into phosphoric steel, and on the formed, first into carbon steel, then into "phosother hand to eliminate a portion of the phos- phone v iron, or steel containing little or no carbon capable of being taken up by the action of the agents of oxidation and reduction com

Manganese may be substituted for the carbon thus expelled by employing an alloy called ferro-manganese, containing at a medium sixty parts of iron and forty parts of manganese This is added to the purified metal while in

state of fusion. It is well known that iron containing phos phorus furnishes a steel with carbon and man ganese, brittle when cold and impossible to roll when hot. It is similar in this respect to the Bessemer metal, which, when it contains onethousandth of phosphorus, is unfit for the man

Instead of the spiegeleisen, before mentioned, an artificial compound of iron and manganese parts of iron and forty parts of manganese are sufficient. These quantities, added to one thousandth kilograms of decarbureted metal, produce the desired effect. The combination of the ferro-manganese can be effected by following the details either in the Bessemer apparatus, in the Siemens furnace, or in any other apparatus in use for the transformation of cast iron or ores into wrought iron or steel.

The ternary steel, consisting of iron, phos phorus and manganese, thus manufactured, possesses many appreciable qualities. It is capable of being worked hot and cold; it presents a great resistance to concussions and

with mouth pieces having cocks C C, which escape of the gases through a common chimney, D. The body of the apparatus is of re-The following reagents, mixed in about the fractory material with an outer coating of metal, and the interior lined with brick work covered with magnesia up to about one-half material. A metallic platform, P, is placed at the upper level of the columns, and is accessible by an iron staircase, E. The mouth pieces GG are shaped so as to form tanks or receivers for the cocks C C. The cocks and their tanks are of cast iron, and are hollowed out in the in terior to receive a continuous circulation of water to keep them cool. These cocks are ad justed freely upon the horizontal shaft O. which imparts to them their respective rotations by cans of a lever arrangement, the clutches M M of which are actuated simultaneously or separately by forked levers under control of the workman. The shaft O receives its motion from a small cylinder, F, through the medium of a lever, I, and rod I', jointed to the piston rod of said cylinder. This last may be actuated by steam, air, or water, the admission of which is governed by a hand lever, L.

The introduction of the air is effected through

the pipes H H, spanned upon a single tube. They are both actuated by an automatic transfer, receiving its motion from the rod I', or otherwise. They are so arranged that one pipe may be open while the other is closed, and act in such relation to the mouth piece cocks C C in each column that the air may be alternately admitted, first to one and then to the other, the cocks opening and closing alternately to regulate the escape of the gases. Instead of the tube h and pipes H, for the introduction of the air, blast pipes may be arranged at the lower portion, and similar to those used in the Bessemer process. The cast iron to be purified, previously brought to a melted state, is poured into the apparatus through the supply openings R R, which are closed by plugs governed by a lever, T, and a stop-key, t. The same arrange ment for closing is applicable to the removal ornfice S. The cast fron is not allowed to rise above two-thirds the hight of the cylindrical part below the charging holes, the charge vary ing from three to six tons, according to the size of the apparatus. The purifying agents are introduced into the molten metal through the holes R R, or through the open mouth pieces C C. A workman on the ground then puts the apparatus in operation by moving the lever I so as to bring the cocks C C and the air pipes H H into the desired position, was to force the molten mass from one side of the U tube to the other alternately, the cocks opening and closing alternately to allow the gas to escape at proper intervals. Fresh quantities of purifying agents may be added from time to time, and the progress of the purification may be viewed through a hole, x, and the exact moment for stopping may be determined. The charge of purified metal may be drawn off through the openings S.

The retort A may be removed by loosening the bolts v v, which hold the junctions, and dropped upon a carriage, Y, when it is desired

to clean or repair the apparatus. Claim-1. The new material, phosphoric steel, consisting of an alloy of iron and phos-

phorus.

2. The improved alloy or steel, consisting of iron, phosphorus and manganese.

3. The process of converting iron and its various ores containing a minimum quantity of phosphorus, as specified, into phosphoric iron

or steel.

4. The process of converting iron and its ores which contain a maximum quantity of phosphorus, as set forth, into phosphoric iron or steel by the employment of manganese.

5. The employment of the reagents herein specified for the formation of a flux to absorb and compline with the sitistium retains.

and combine with the silicium, sulphur, and other impurities of the metal, and free it from

6. The combination of the alternating pipes H H with the alternating cocks C C, arranged to operate as described.

7. The removable crucible A, in combination with the tubes B B.

8. The combination of the bollow cocks C C.

8. The combination of the hollow cocks C C with the tanks G G, by which they are supplied

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Some valuable statistics in regard to the comparative cost of living in America and Europe are given in the last Massachusetts Labor Report, from which we take the following:

"One dollar will buy twenty pounds of flour in Boston, one or two pounds more in several European seaports, but the same or considerably less in a majority of the places compared. In Boston one dollar will buy 5.56 pounds of fresh beef, roasting piece. In no place in England will it buy so much by a pound or more, and in Europe still less, Copenhagen being the only place given where it will buy more. Butter in Europe averages a pound more to the sents a great resistance to concussions and efforts of bending. In fact, it will stand all tests to which ternary steels, with carbon, are specially adapted to the manufacture of the strongest ralls.

The chemical purifying agents hereinafter described are constantly passed through the molten metal or ores in the aerodynamic apparatus, and are constantly stirred with the same while in a state of fusion by the action of the air. These reagents constitute true fluxes, fusible at a medium temperature, which will mix with the silicates and metallic oxides formed by the oxidation of the sulphur, silicium, de. Their effect is to take up the oxidized silicium, sulphur, de., and combine them with some base upon which the molten metal cannot produce any reductive action.

The reagents are, first, calcic oxyfuoride mixed with equal parts of lime and fluoride of calcium; second, chloride of sodium and hypochloride of lime, mixed in equal parts; third, dollar than here, cheese less by more than that,

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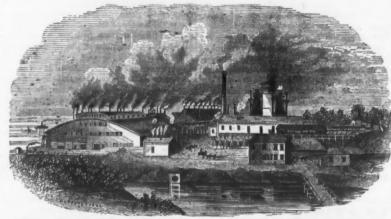


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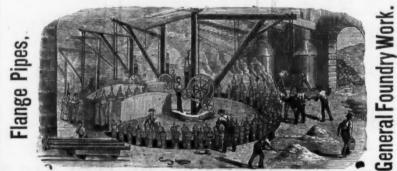
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BY MR CHARLES FAIRRAIRN.

(Concluded).

I have said that a furnace may be more efficient for one kind of fuel than another; but the principal causes of loss in the ordinary furnace enumerate here: (1) Loss of coals in firing. The best coal is often small and very brittle, and in stirring the fire a large quantity falls through the spaces between the bars, more especially when there is a necessity for hard firing to promote combustion; (2) the loss from unconsumed gases passing away, being burned into carbonic oxide from want of the requisite quanthe fire burning into holes and allowing the air to pass through, or absence of means for regu- tity be kept on the bars; there is not so much lating its admission; (4) loss of heat by radiation danger of the carbon passing away without its the quantity of heat passing to the chimney. One difficulty—that is, regulating the supply of to liberate it. In bituminous coal the bitumin artificial means, either by a fan-blast or steam-

ELEVATION

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However, the arrangement of furnace I will de- | we have carbureted hydrogen, nitrogen and

never saw it before, nor am I aware that any-thing of the same kind has been tried, and to it of heat in different substances, we are compelled

scribe presently may or may not be new. I carbonic acid gas or oxide.

Furnaces and their Construction and the plates of the boiler at high speed, cannot these fires are really indispensable, and while we have the cooling effect inseparable from the distillation of gas from coal, and then the cooling effect added of the flame coming in contact I have stated above, and which I will again lest it refrigerate the flame and prevent that vivid combustion of the fuel so essential to the maximum production of heat by its means and this is simply what we do.'

I have again to mention that a furnace which answer for another. Thus, the conditions under which coke and anthracite coal enter into combination with oxygen are much less comtity of air; (3) less from too much air, either from plex than in burning bituminous coal, and the great point to be observed is that a large quanthrough the walls of the furnace; (5) loss from supply of oxygen-in fact it cannot do so, as it cannot rise until it has its quantity of oxygen air to the furnace-can only be overcome by ous portion is only serviceable for heat when converted into gas, while the carbonaceous por ct. I believe the time is fast approaching when | tions are consumed only in the solid state, and the supply of air to furnaces will be regulated they must be separated, as explained, before in this way as the most efficient and economical, they can be consumed. Thus, when coke or and as obviating a great many of the faults of anthracite coal are burned, the products are our present furnace. The idea is old enough. carbonic acid gas and nitrogen; while with coal

complete combustion of 2 lb. of carbon, or in any sense be made economical. In this case | 14.500 × 2 = 29,000 units. Knowing the total number of thermal units in any combustible, we can soon ascertain the highest temperature that can be produced in the furnace with any kind of fuel, the products of combustion of with the boiler which has to be heated. Dr. coal being carbonic acid, nitrogen, steam and Ure says on this point: "When a boiler is set ashes. And if we take the means of the speciover a fire it should not be too near the grate, fic heat of these products, we find that they come very near the specific heat of the air. Again, as 12 lb. of air will supply as much oxygen (supposing the whole of the oxygen to be taken up) as will be sufficient for the combustion of 1 lb. of carbon, the total weight will be will suit admirably for one kind of coal will not 12 lb. of air + 1 lb. of carbon = 13 lb. Now the total heat of carbon we have seen is 14:500 units of heat, and the mean specific heat of the products of combustion is 0.238; thus this nean specific heat x 13 lb. of air = 3.094 and $\frac{14500}{3\cdot094}$ gives $4691\deg$.; this, however, is on the supposition that every atom of oxygen is used.

If twice that quantity is used, as is usually the case, then the temperature will be 2437 deg. If we take a forced draught by fan or otherwise, by the same calculation we arrive at a temperature of 3137 deg .- the supply of air being 18 lbs. to one pound of carbon These figures are rather complicated to carry in the mind, and perhaps might have been dispensed with here. But there is one result we arrived at in their use we may follow a little further-we find that there are 14,500 units of heat in a pound of earbon, which if it could be all used in a steam engine would give stupendous power; we found that the unit of heat = 772 foot-pounds and 14500 × 772 = 1,119,400 or 339 horse-power; and therefore, when we speak of a loss of about 60 per cent., we are left with 136 horse-power; and as in the Seimens furnace he claims to save 40 per cent. on the latter, we arrive at 190 horse-power from one pound of carbon. It is supposed that in some instances we have realized about 70 per cent. of the theoretical heat in fuel. This I would be inclined to doubt. We have seen that with the ordinary furnace we lose about 25 per cent. in getting a draught; we have to add to this loss from small coal, too much or too little air: the products of combustion flying off to the chimey at a speed of 30 ft. in a second in some instances, it must be abundantly clear that 50 per cent. of the heat of fuel we is lost. It was stated not many weeks ago that, in some processes in connec tion with the manufacture of iron, the quantity of fuel used was sufficient to produce the desired result fourteen times if properly applied. I think it is clear we begin by placing the chimney at the wrong end of the furnace, and the air ought to be driven in, not drawn through. We have seen that when a blast is used we can have a pressure in the furnace sufficient to balance the pressure of the atmosphere. The waste heat could also be made to do work in

passing away. There is indeed plenty of room for improvenent; there is an abundance of facts on which te exert our reasoning powers, and ample space for experimental research. We want new ideas or thoughts, which, after all, govern the world. This is at least the lesson which our experience teaches as we grow older; and if with our pro gress we learn a wise humility, we will also lean that the more we know and acquire, the more our ignorance and dependence become apparent to ourselves. We learn also that, strive as we may, we never get beyond the border land of knowledge, and that there are secrets beyond that boundary which will never be revealed on this side of the great change

A Curious Electrical Phenomenon.

which awaits us all.

The Virginia (Nev.) Enterprise of the 17th

During the past three nights the engineers and machinists at the round house of the Virginla and Truckee Railroad Company, in this comotives may stand under it and cool off when

The first that was observed of these was about 11 o'clock, four nights since, when P.

in which the gases could be properly ignited be sufficient supply of fresh air, it burns with a The next day nothing was seen of 1f, but the doubt that the furnaces of ordinary steam boil- lb. of oxygen, making 7% lb. of carbonic acid comotive came in and stopped under the funnel ers are extremely faulty. A long tube of small gas, and giving additional heat of double the diameter, in which the complicated processes amount due to the combustion of 1½ lb. of charged, and began snapping and cracking, of mixing the air with the combustible gases, carbonic oxide; that is to say, 2 lb. of carbonic sending out sparks and flashes on all sides. So of distilling these gases, and igniting them oxide 10:100 × 2 = 20,200 units, to which being it has been every night since. They now know while they are hurried away over the surface of added the heat produced by the imperfect that the heated locomotive causes this electrical combustion of 2 lb. of carbon, or 4.400 × 2 = display, but in just what way is that which is

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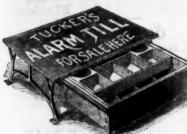
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furthest from the place where the flame makes quantity is usually shown by the letter J, in its escape. The hearth is of fire brick, and honor of Dr. Joule, who discovered this unit of during the meal hours all the ashes and clinkers heat. Dr. Joule found by careful experiments are removed by the hole in the side of the fur-that the power developed by the fall of a pound nace. The area of the hearth is about two-thirds weight through 772 ft., will raise the temperaof the area that it was previously; the blast is ture of a pound of water 1 deg., and this is ntroduced above the new coals, and passes called the mechanical equivalent of heat. The through them. As the coals begin to ignite, investigations of Messrs. Faber and Silberman all the inflammable gases are forced through regarding the total heat of combustion in therthe fire, and at the same time mixed with air. mal units, are generally recognized as the stand The advantages with this kind of furnace seem and now, and they have been condensed by the to be the following: (1) The whole of the late Professor Rankine, of Glasgow, as follows: gaseous products are made available; (2) there is entire absence of smoke, in consequence of at first, that is to say, one pound of carbon com-ALWAYS RELIABLE control which the attendant has over the furthe quantity of heat in thermal units is 14,500 above the roof of the round house. At the to each pound of carbon. But in other cases, base this smoke stack is spread out in the shape

I have added a supply of air by means of a to use some standard by means of which any blower. In this furnace, of which the drawing quantity of heat may be measured, and the is a longitudinal section, the coal is introduced standard generally used is the thermal unit, or from the top, and is always on the top of the quantity of heat required to raise one pound of incandescent fuel, at the side of the furnace water 1 deg. Fah. In algebraical formulæ this "The burning of carbon is always complete

Again, to enable us to compare the quantities

air, the waste of fuel is very great, as the car- experiments, and found that the slove was fully fore passing below the boiler. There is no blue flame, combining with an additional 2% next night, about 11 o'clock, shortly after a 1. *Abstract of a paper read before the Edinburgh combustion of 2 lb. of carbon, or 4 kb × 2 = display, but in just and Leith Engineers' Society.

perfect combustion; (3) there is a smaller bines with 2% lb. of oxygen, and makes 3% lb. quantity of air required, probably about one- of carbonic acid; and although the carbon is fourth less, that is, about 18 lb. to 1 lb. of solid immediately before the combustion it city, have been in a state of lively excitement coal; (4) no increase of temperature above passes during the combustion into the gaseous about some strange electrical disturbances the external air is required in the chim-state, and the carbonic acid is gaseous; this ney, and the escaping heat from the fur-terminates the process. When the layer of car-three nights all hands have been engaged nace can be used for other purposes; bon is not so thick, and the supply of oxygen trying to soive the mystery, but have only parti(5) a higher temperature in the furnace, and is not so small but that oxygen in sufficient ally succeeded. The company erected a large nore rapid circulation of heat; (6) the perfect quantity can get access to all the solid carbon, smoke stack, which rises to a considerable hight lighted and into operation in less time, when part of the solid carbon is not supplied directly of a funnel. It was built in order they have not been in use. There is also another with oxygen, but is first heated and then disvery important point in connection with this solved into the gaseous state by the hot car- they came in off of the road, and also while bemethod of making reheating furnaces-that the bonic acid gas from the other parts of the furing fired up in the morning. Into the side of air can be so nicely adjusted by means of the nace. The 3% lb. of carbonic acid gas from this smoke stack three or four days ago was blast and damper as to insure that nearly all the 1 lb. of carbon are capable of dissolving run a stove pipe from a stove standing in a oxygen will be taken up by the carbon and an additional pound of carbon, making room about 40 feet distant. It is about this gases, in consequence of which the iron is 43/4 lb. of carbonic oxide gas, and the stove that the electrical disturbances take place. neated with searcely any loss from oxide or volume of this gas as double of that scale. The balance of pressure can be made so of the carbonic acid gas which produces that even when there are unprotected inlets to it; in this case the heat produced, instead of Pippingham, a well known machinist, apthe interior of the furnace, the flame can be being that due to the complete combustion of proached the stove for the purpose of putting a made to come to the edge of the open space. 1 lb. of carbon, which is as we have said = 14, stick of wood into it. As the stick neared the I believe the efficiency of the furnace might be 500 units, falls to the amount due to the imlargely increased by using hot air, which might perfect combustion of ×2 lb. of carbon burned his hand and his arm was becumbed. He a be done by passing it through pipes or brick- to carbonic oxide; thus = 2 × 4.400, being first thought he had taken a sudden cramp in work placed in the flues; for if we have the the number of units of heat in carbonic oxide his arm. In trying again to put t'e wood into heat of the furnace 2500°, and the entering air = 8800 units, showing a loss of heat = 5700 the stove he received a second shock. This heated to 500°, the result would necessarily be a units, which disappears in volatilizing the sec- time he perceived a flash and heard a sharp great saving. On this point we have the experience of blast furnaces as an indication of here, as it does in furnaces badly supplied with what might be saved by this means alone. The application of this method of construct- bonic oxide has a large quantity of carbon in it and heavily charged with electricity, it giving ing furnaces is more difficult to existing steam which is dissipated in the air without any useful out sparks and flashes when a piece of iron, boilers, and this we can only accomplish by effect. But when the 4% lb. of carbonic oxide steel, wood, or the naked hand approached it. constructing a separate combustion chamber, gas containing 2 lb. of carbon is mixed with a After an hour or two the phenomenon ceased.



NICHOLSON FILE.

All Nicholson Files are cut with the Patent Increment Cut, an invention owned and controled exclusively by us, the file out in this manner being Patented as a new article of manufacture, and differs from all other machine out files (all of which have their teeth cut with equal spaces) by being cut with teeth slightly expanding or increasing in size and space from the pair!, thus avoiding the too great regularity of teeth common to all other machine cut files. The tendency of all cutting tools with teeth or cutters placed at regular distances from each other may be illustrated (to the machinist at east) by the fluted reamer—as it is well known that if a round reamer be made with (say 12) teeth whose spaces are equidistant, the hole reamed will not be round and smooth, but will approximate to a hexagon in shape. Whereas, if the same number of teeth be made of irregular distances, the hole reamed will be both round and smooth. The same is true of a file, hence the necessity of its having teeth at unequal distances, and to which we have applied the name of Increment Cut File, which possesses all the advantages of hand cut work, and the accuracy and uniformity of machine work. It is now upwards of seven years since this File was introduced to the public, and the demand has increased until our production is undoubtedly treble that of any File manufactory in the country.

We put all files under seven inches in boxes of either one-half or one dozen each. These boxes are neatly arranged, and open on the end, on which the kind is plainly marked with printed labels, acknowledged improvements

on the old methods.

The "Increment File" is not an experiment, but an established fact, and already has acquired a legitimate demand for upwards of 500 dozen per day. We employ no regular Travelers, but our goods may now be found in the hands of the principal jobbers and dealers throughout the country.

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Brass & Copper Chain,

And patented attachments for same, for suspending windows, from 100 to 1500 lbs. Sashes can be suspended with my Chain and attachments in a shorter time and with less trouble than by using the ordinary common cord. I am now offering the Chain and fastenings cheaper than any other in the market. Also manufacturer of the MORTON & BREMNER'S Straight and Circular Spring Balances. Established in 1842. Murray St.,





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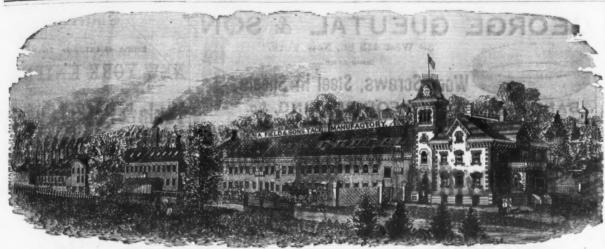
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Any variations from the regular size or shape of the above named goods made from samples, to order.



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All orders should be addressed to their

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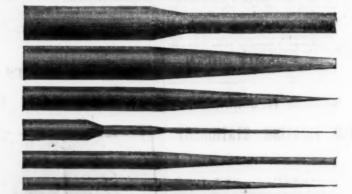
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BUSINESS ITEMS.

PENNSYLVANIA.

Hussey, Binns & Co. is the name of a new firm formed at Pittsburgh for the purpose of manufacturing shovels by a new process. They pany, of Hamilton, have recently made a conhave purchased the works of the Union Car Coupling Company, at the corner of Twentyseventh and Railroad streets, and will begin operations as soon as the machinery, which is they will manufacture is one for which a patent pumps, to be driven by duplex engines. This has been granted Mr. Baker, a member of the firm, and for many years employed at the Lippincott factory

The Union Foundry and Manufacturing Com pany commenced operations at Reading the

The Schuylkill Works, at Phonixville, are making satisfactory progress in copper smelting, having already smelted ores from Chili, Cuba and Spain. The article produced is so good that the Philadelphia mint, hitherto supplied entirely from Lake Superior, recently purchased 15,000 pounds.

The works of the Columbia Iron and Steel Company, at Laucaster, have been purchased by Messrs. Maitland, Audenreid & Co., bankers and brokers, Philadelphia. Colonel Case will pay the creditors. The affairs of the old company have been satisfactorily settled, and the roceedings in bankruptcy withdrawn. The works will soon assume their wonted activity.

The Johnstown Tribune, of the 13th inst. says: It is with extreme pleasure we are able to state that the iron works here are again run ning to their full capacity, double. The steel works is also in full operation, as there is sufflcient water in the reservoir to permit the man ager to go ahead.

The seven vertical engines which will furnish notive power for the Phœnix Iron Works, at Phænixville, are nearly completed. This company recently discharged 100 more of its bands.

The Bessemer department at the Harrisburg steel works is again in operation.

CONNECTICUT.

Clocks from Thomaston are being shipped to

Troy, who will enlarge the works and increase the business.

The prospect of Hayden, Gere & Co., estab lishing their brass works at Holyoke, has proved to be a delusion, and the citizens are omewhat disappointed. Some of the heavy capitalists of the place have conceived the idea of establishing equally extensive brass works with those which they have thus far failed to secure. The water-power company will offer the same inducements as were held out to the Haydenville parties. This new enterprise is likely to be carried out successfully, as those having it in charge are determined to make every effort in their power to bring about the desired result.

Smith & Wesson, of Springfield, are about to manufacture several thousand Schofield pis-tols as an experiment. The failure of the Smith & Wesson pistol to please the government examiners is attributed to the closeness of its work, that is the nicety with which the parts fit together. This closeness, while an admirable feature in a well kept revolver, renders the machinery liable to stick when rusted or subjected to rough treatment. A loose jointed pistol is clear from this objection, and so beter adapted to hard military use. Smith & Wesson have another order for 20,000 pistols for the Russian government, but the model hitherto used is considerably changed. The hump in the stock has been reduced and changes made in the operation of the shell extractor and other parts of the mechanism. The manufacture of these pistols will furnish work in the on for the balance of the year.

ощо.

The iron safe works at Canton employ 255 men, and are said to be the most extensive safe and vault works in the country. They recently sent to Boston six large iron vaults weighing ten tons each, which will protect the valuables of some of our Boston merchants.

The Findlay Machine Works, Coons, Adams & Co., manufacture steam engines, circular saw mills, wood sawing machines and mill gearing. The foundry in connection with the works has been in operation 15 years, but the organization of the present firm dates from the first of September, 1872. The building is 46x100 feet; pattern house 25x35 feet; ware room 40x80 feet. There are several other buildings in connection with these. The average number of men employed during the year is 40, and 270,000 lbs. of iron are annually worked up. A specialty is also made of circular saw mills, which have an unsurpassed reputation. A specialty is also made of repairing machines of the same and Nail Works have the country. They recently safe works have in the works and the same and specialty is also made of repairing machines of

son county, has incorporated with \$160,000 capital stock

The smelting furnace at Ophir, Jackson ounty, has gone into blast.

The Cope & Maxwell Manufacturing Comtract with the town of Clinton, Iowa, to furnish one set of machinery for their water works, with compound engines, the cylinders of which are convertible from condensing to non-conlready contracted for, is in place. The shovel densing. They are making another set of company are making special efforts in the manufacture of water working machinery, have taken several contracts, and have others in abeyance. A large pumping engine has been recently sent to London, England, for use in mines, the attractive point being the valve, whose cushioning feature prevents, with certainty, the overrunning of any of the moving parts of the machine, and permits an entire stroke, without loss of clearance, or excess of clearance, for the main piston. This makes fourteen pumps sent abroad in four years.

MICHIGAN.

The Riverside Iron Company was organized at Marquette on the 14th inst., with a capital stock of \$500,000. The following named gentlemen are the stockholders and directors: Seth D. North, of Hancock; John A Owens, of Pittsburgh; and Samuel S. Burt, of Marquette, who elected the following officers: S. S. Burt, president; vice president, David Richey, Pittsburgh; John A. Owens, secretary and treasurer. General office located at Pittsburgh, Pa. The property to be worked by this company is the southwest quarter of section 36, town 47, north of range 30 west, Marquette county.

On the 14th inst. the Metropolis Iron Company was organized at Marquette with a capital of \$500,000, divided into 20,000 shares, of \$25 each. The stockholders of the company are: Seth D. North, of Hancock; S. S. Burt, of Marquette; John A. Owens, of Pittsburgh. The company will work the south half of northeast quarter and north half of the southeast quarter of section 2, town 46, range 30 wast. Marquette MICHIGAN.

company will work the south half of northeast quarter and north half of the southeast quarter of section 2, town 46, range 30 west, Marquette county. Directors: Seth D. North, John A. Owens, S. B. Burt, David Richey, of Pittsburgh, and Seth C. Baldwin, Escanaba. President, S. Burt; vice president, David Richey, Pittsburgh; John A. Owens, secretary and treasurer, Pittsburgh. The general office is at Pittsburgh. Pa.

WISCONSIN.

WISCONSIN.

Clocks from Thomaston are being shipped to Yokohama, Japan. A number of boxes of them went down the Naugatuck Railroad recently to Bridgeport, and were transhipped for San Francisco via Housatonic Railroad and its connecting lines.

The Woodruff Iron Works, of Hartford, are putting a large boiler into the new factory of the Eagle Lock Company, in Terryville. The company are well supplied with orders, and are doing an extensive business. They have a large force of workmen in their employ, and are running full time.

MASSACHUSETTS.

The foundry property of C. C. Shaw, of Palmer, has been sold to Egerton & Davis, of Troy, who will enlarge the works and increase the business.

ILLINOIS.

ILLINOIS.

Lane & Co., at Chicago, are the proprietors of the Western Chain Works, in that city. The company have been organized since 1870, and are now shipping their products South and West. Their manufactures consist of anchor, dredge and cable chains, and the excellence of these articles has created an enormous demand for them. The firm are contemplating erecting a very fine building, to give them facilities for meeting the large demand now existing for their manufactures. They employ thirty-five hands, and turn out annually about \$100,000. This company had all their property destroyed by the great fire, but were again in operation in less than two weeks. It is the intention of the company to treble their present twenty fires, which would give them an enormous capacity.

area, which would give them an enormous capacity.

A new branch of manufacture was established in Chicago last fall, which promises to be very successful in its results. The name of the establishment is the Chicago Steel Works, and their productions consist of steel plow beams. This is entirely new to agriculturists, but promises to be generally adopted. The ingot whence the wrought cast steel plow beam came is taken direct from the heating furnace, rolled and shaped into a beam with machinery. came is taken direct from the heating furnace, rolled and shaped into a beam with machinery, the invention of the gentlemen engaged in the manufacture of it. It is not subjected to the ordinary process for shaping articles of steel. The lngot in three passes after leaving the furnace comes out a beautifully shaped plow beam, ready to be attached to the plow. The object is to supply farmers with a plow beam stronger, more durable and much less in weight, it weighing ten pounds less than an iron one.

The business of the machine shops in Indianapolis is improving. The Eagle Works are snipping portable engines and separators, and have orders ahead. The Quaker City Works have added 25 men to their force, and the Western Works are humping with the contraction. Western Works are humming with a rush of

ousiness.

The Vigo Iron Company, Terre Haute, manu-

specialty is also made of repairing machines of all descriptions, while in the manufacture of wood saws they challenge competition. In November last the firm built an addition to their works, of brick, 103x40 feet and two stories. They have just commenced the manufacture of every description of school desks, and have contracts on hand for 500.

P. P. Bush has gone into the general foundry and engine building business in Canton, having leased a portion of the Aultman Steel Company's building, in that place.

The Eric Coal and Iron Company, of Jack. ine Terre Haute Iron and Nail Works hav

H. W. PEACE,

KINDS SAWS

FACTORY, WILLIAMSBURGH, N. Y.

CO., AMERICAN SAW

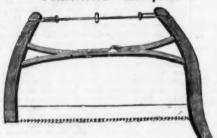
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Solid saws require frequent gumming, thereby subjecting them to risk of springing or breaking. This is especially the case with cross cuts having Patent Tooth. In the perforated saws all gumming is avoided and the teeth are easily kept long and in proper shape, saving files, labor, expense and rea As is well known, our saws cut faster, smoother and easier than any other.

MOVABLE-TOOTHED CIRCULAR SAWS AND SOLID SAWS OF ALL KINDS.

Hankins' Elliptic Forked Saw Frame.



Patented June 28th, 1870. The annexed engraving represents Han-Kins' Elliptic Forked Saw Frame, which commends itself to the trade for its simplic-ity of construction. The Forked Brace being all in one piece, without any center bolt, secures for the Frame great strength and durability. These Frames are put up with my best Webs, marked "No. 40, Harvey W. Peace."

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DIAMOND CROSS-CUT SAW.

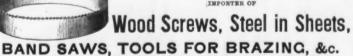
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THIS new Saw, which is destined to take the place of all Cross-cut Saws in point of SPEED AND EASE, is manufactured by E. C. ATKINS & CO., Indianapolis, Ind., who are the SOLE MANUFACTURERS FOR THE UNITED STATES. Cross-cut Saw in the market that we CHALLENGE THE
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Saw Manufacturers and Repairers, Indianapolis, Ind.



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Bed Screws, Pin Hinges, and Wire Nails a Specialty.

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Two Direct Cutting Edges, instead of one Scraping



Note extra steel and durability over the old V. out-

I am willing and extremely anxious, on proper notice, to accept a Challenge from H. Disston & Sons, or any responsible Saw Manufacturer, and am ready to back my words with appropriate deeds and \$500 expense, if beaten.

N. B .--- With Hand, Billet or Cross Cut Saw, \$500 on each. E. M. BOYNTON.



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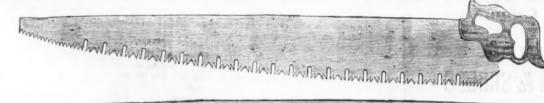
William N. Jennings,

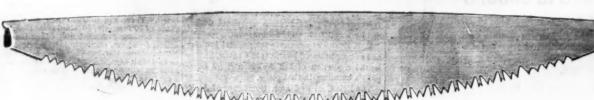
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Half Cloth. (Cloth Back and Corners, with Mo-rocco Paper Sides—a good, serviceable Binder.) Full Cloth (Morocco Cloth Back and Sides.) Half Roan.....(Roan Back; Cloth Sides.) Half Morocco..... 2.00

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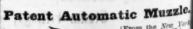
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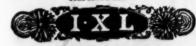
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PHILADELPHIA, July 27, 1874. Public attention has rather been attracted in this vicinity of late to the shortcomings of metropolitan divines and the mysterious abdue tion of missing children than to general business. Nevertheless, a fair amount of trade is being done, and some items of local interest are furnished for your readers' benefit. The season is proverbially the dullest of the year, and although in 1874 marked by manifold friends are such dashing, happy-go-lucky felincidents of disaster in various sections of the country, is otherwise unnoticeable.

The week before us will be memorable in a scientific point of view, by the celebration, at Northumberland, in this State, by the chemists, of the centennial anniversary of the discovery of oxygen by Joseph Priestley, the English chemist, who made that village his home during the new Chicago and the amazing enterprise his latest years. While the chemists have a nomentous work before them, in enumerating in the mountains of Pennsylvania the various steps of progress made by science within the past hundred years, they have a still more inviting task in declaring or speculating upon the possibilities of the progress of the coming centenary period. Reasoning from the past, the advance of science should be in an hundredfold ratio of progression, until the control of the elements should be entirely within the grasp of man. And while treating of scientific procreated State Geological Survey of Pennsylvania, to the charge of which Prof. I. P. Lesley was appointed. The purpose of this survey is to make such investigations as may be required to thoroughly elucidate the geology of this State, and to make such full chemical examinations of ores, coals, oils, clays, soils, fertilizing and other useful minerals and waters, as shall be required to afford the agricultural, mining, metallurgical and other interests of the State a clear insight into the character of its resources." Prof. Lesley has appointed pine assistants who are provided with aids and working parties, and has gone himself to Eu-

nine assistants who are provided with aids and working parties, and has gone himself to Europe to obtain certain instruments not to be had here. His force is, however, progressing with the work, and the result, when the survey is completed, cannot fail to be of immense advantage to the industries not only of this State but of the whole country.

A great coal suit has just been decided in which coal lands in Luzerne county to the value of forty million dollars were the subject of hitigation. The parties to the suit were Turnbull vs. Pardee, and independent of the immense value of the lands at stake the case had an air of almost theatrical romance about it. The property was originally and for many years in the hands of the Turnbull family, of Philadelphia; the last holder, being the father of claiment, failed to psy taxes, and title was sold to cover delinquency in this line. Subsequently, the lands came into the hands of the father of Plaintiff died in Philadelphia before the great value of the land was known, leaving a divorced wife and a son, present plaintiff, who soon after went to sea. The mother, in 1852, was advised she had rights in the lands for the benefit of the son, and desired to commence action for ejectment. The existence of the heir was required, and for twenty years that interesting individual was sought and only discovered in 1871 in Mazatlan, in Mexico. His career had been unusually adventurous, varying with shipwrecks, capitlyity, robbing, etc., from time to time, and after having been the sole survivor of numerous terrible escapes, he arrived in Philadelphia in 1872, the presumptive heir to forty millions of coal property. By all the laws of poetic justice he should have succeeded to the title. Unfortunately, however, the decision of the-court was in favor of this magnificent novel entirety frustrated.

Your columns have frequently reviewed the law of trade marks. A curious suit was instituted here last week by one manufacturing firm against another, to prevent the use of the word "Centennia

to change the name of our show.

The Ceatennial work progresses fairly and as rapidly as can be expected. The grading for the exposition building is done, and work on the foundation commenced. The grading for the exposition buildings is progressing, but the contracts for the iron not yet definitely let, with no end of hard feeling about it, and no little wire pulling, although it is not likely to be either a large or profitable job. Probably the matter is in as good hands as it could be, and if the people will only esthusiast as they should for the next two years, we will be quite satisfied, as a nation, with the result.

A trial was made here lately on the line of the Westchester Railroad of the Henderson hydraultic lie car brake, already in use on that road for

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AARON Burkinshaw.

AB
MASSACHUSETTS,

PHILADELPHIA CORRESPONDENCE.

What the Underwriters Demand of Chicago.

The Journal of Commerce says :

A slower people than those of Chicago would not have needed two costly lessons to teach them how to build a city. But our Western lows, that after the first great fire, while the ashes were still hot, they went to work rebuilding the same kind of houses that had vanished in the frightful furnace. In this they violated law and common sense: but they reonstructed their beautiful city almost in a night, and compelled the whole world to admire that had called it into existence, "as if by stroke of an enchanter's wand." The fire of '71 broke out in a mass of wooden houses, and there gained the destructive headway; and there fore the city passed an ordinance prohibiting the erection of any wooden buildings within the burnt district. Free and independent citizens paid little attention to this rule. They made the principal edifices of iron, brick of stone, but stables and carriage houses were built of wood as before. This infraction of the law was never punished. There was no ordinance adopted against mansard roofs; and had such an ordinance been enacted, the Chicago people would not have minded it much. Left to themselves, they raised giddy and inac cessible towers in all directions; and these would have insured the destruction of the city had the second fire not been luckily (skillfully is not the word) checked before it could get hold of them. The same neglect and recklessness extended to all other matters, most lamentably to the toleration of the worst fire depart ment in the country, and to the scant water supply. Disgusted and disheartened by these abounding signs of indifference and inefficlency, the Fire Underwriters of Chicago now threaten to withdraw from the city, unless re forms are introduced which may be summed up as follows: 1. The Fire Department must completely reorganized and stripped of political connections. 2. Fire limits must be extended to include the whole city, and no frame buildings allowed to stand within them 3. The city must have a force of sappers and miners. 4. Water supply must be at once increased. 5. Mansard roofs, except when made fire-proof, must be prohibited. 6. Lumber yards must be gradually removed to more remote localities. 7. The city must put floating engines on river and lake. Under the circum tances, these requirements are reasonable. No conservative company will risk its money on Chicago while that city deliberately invites fire to sweep her from the face of the earth. The Common Council and all the mis-rulers of Chicago are so deeply interested in keeping up the present wretched Fire Department that we cannot hope to see a revolution wrought there and without that, nothing else will meet the want. Probably more water will be supplied; the erection of new wooden buildings within the corporate limits may be prohibited (as a dispatch which we published this morning indieates) though it is not very likely that such buildings now standing will be removed; a sapping and mining corps will be created, and new engines will be procured. As to Mansard roofs, the insurance companies may regulate these by advancing the rates on them. Nothing less than a whirlwind of indignant public opin ion will cause the city authorities to reorganize the Fire Department; and probably this radica change cannot be made save by a true reform victory at the next election. Chicago sadly discourages and tries her best friends, but the do not dispair of her!

house. These shops are very models of neatness, some of them containing a varied assortof art; while owners, with their long queues and costly silken garments, sit in their places of business like princes in their drawing reoms, exhibiting a quiet dignity, and even courtliness, strangely unlike the manners of the races about them. Every line of merchandise is duly represented-silks, teas, fancy goods, lacquered wares, jewelry, plate, time pieces, books, musical instruments, birds' nests, confections, drugs; everything that can be called for, native and foreign, is now obtainable in the large cities on the coast, so rapid has been the improvement in the last twenty years. But the provement in the last twenty years. But the ushering of the returns of the Pennsylvania Railroad for the first six months of 1874 show a highly encouraging state of earnings, especially for dry times. The receipts of the line east of Pittsburgh were \$18,031,862; the expenses, \$11,809,073; net profits, \$6,204,793. Compared with 1873, the gross receipts decrease a million and a half—due entirely to dull times, but the expenses of the same period are three million dollars less, showing what a wise and energetic revival of business the receipts of the road will largely increase, while the expenses will continue at the same economical scale, showing what the whole country will sooner or later discover, the advantages resulting from commercial crises.

Steat a same way safety be styled our substitute in the last twenty years. But the ushering in of the new epoch has not entirely banished the old, as witness the stores where gods are made and sold for silver dollars! Ay, and "warranted" too—a god of wealth "sure to makee glow riche," says the politic vender; gods of fair weather and guardians of health; gods for the sailor and for the farmer—for every condition of life, every emergency, and at all prices. Among the most attractive of the shops are the fruit and flower stalls, usually adorned with pretty bird cages, while John Chinaman deals out his dianty wares, served in exquisite porcelain or glass, with layishing salaams and courtly

sion to their taste which is more heartly appreciated by none of them than said correspondent himself. and at the upper end was the inevitable altar, never wanting in either dwelling or place of business, on which fresh offerings of tea, cakes and fruit were laid every morning, and inceuse burned perpetually. The old man said that the fire had never once gone out since the days of his grandfather, who built and furnished the house, to which Sao Qua had duly succeeded, and which his son would inherit after him. Said son was a frolicsome little five-year-old, exuberent with bolsterous mirth, the child of Sao Qua's old age and his inseparable companion. It was beautiful to see them thus together, the weary old man seeming to grow oung again in loving contemplation of the child's merry pranks; and the little one always tender and gentle when he approached the doating sire, whose years and infirmities were an enigma his fresh young nature sought in vain to comprehend.

Our Iron Industries in the Last

Acreluis, in his history of New Sweden, de-

cribing the new trade of this country at the time at which he wrote, says: "The greatest part of the iron in America is taken from the Pennsylvania then had Grubb's iron works in Lancaster-now Lebanonounty; the furnace making twenty-four tons a week for four near and two Maryland forges The pig iron reached England via Maryland; the bar was sold in the interior and at Philadelphia. French creek, in Chester, had two furnaces and supplied six forges. Sarum had three more in the great valley; a mine and furnace at stacks; Crum creek two, and there were two in Durham, Bucks county-"the best iron works in the county; " Manatawny, in Berks, with a furnace and forge, and Dixon's in New York. New Jersey had six mines, six furnaces and two forges-Union, Oxford, Sterling, Oyden's and Mount Holly. Two are named of several iron works in Maryland, and there were two New England furnaces, with forges supplied from Pennsylvania. The edge tools were better than could be procured from England; and there were twelve bloomeries. French Creek had a steel furnace. In 1753 Reading forge produced 850 and Warwick 720 tons of bariron; the Union and Durham Works getting a ton of pig from a ton and a half of ore, and a good furnace averaging 20 to 25 tons weekly in biast. A forge with three hearths, well attended, gave two tons a week, and a clear profit of £6, 12/8. sterling. The workmen were English, Irish and a few Germans; the laborers, negro slaves and German and Irish servants bought for a term of years. A good negro cost £30 to £40, sterling, equal to 1500 to 2000 Kapper mynt dollars; a white servant was paid \$350, K. M., and his food, equal to \$325 more. The negroes were better treated than anywhere else in America. Labor was stopped at the furnaces and forges for four summer mouths. Hickory charcoal was the best fuel known, and it was understood that "fron ore in Pennsylvania is more abundant than the people will ever use." Bar 1ron brought £20 per ton at the forge-£14 and £16 in Philadelphia; pig £3. 6/ and £3. 10/ at the furnaces— £5 in Philadelphia. The iron works were mostly within 40 miles of Philadelphia, and the carriage 20/ sterling per ton. Pig at the furnace cost the proprietor £2 per ton, and sold for £5 in Philadelphia. It cost £2.8/per ton to transmute pig to bar iron, that sold for £10 at the forge, £19. 6/ and £20 in the country, and £15 in Philadelphia. Castings brought £5, 6/8 per ton at the furnace, and £2 more in Philadelphia. Maryland sent pig to Philadelphia to buy West India goods, and it was exported to London, the West Indies and other British American colonies. "London, with the exclusive privilege of the trade, received American pig and bar iron, used for ballast, free of duty, in exchange for exportations; and in 1757 Bristol and Liverpool are preparing to avail themselves. But perhaps only a few vessels, with a full cargo of iron, will be send over to England, it being too heavy a freight for the high sea; and perhaps that exclusive privilege will not, for some years, be any injury to the iron trade of Sweden."

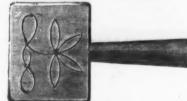
A small vein of copper ore was found in Lebanon county by Peter Grubb, and Chancellor Charles de Geer had specimens in his cabinet. Wm. Plumsted, Esq., found rich specimens in Bucks, and a mine at Rocky Hill, N. J., vielded ment of costly wares, and occasionally works two pennyworths of gold to the pound, until Governor R. H. Morris paid £2000 sterling for one-eighth interest for eighteen months, when the yield immediately fell off. Schuyler's mine, near Belleville, in Jersey, had been worked 30 years, and the ore was sent to London. A rich copper mine at Pipe Creek, Md. : ailver ore in Pennsylvania, and lead yielding 124 ounces silver per ton are reported.

California Built Marine Engines .-Californians are rejoicing over the success attending the building of a compound marine engine at a machine shop in San Francisco. It was put in the steamship Los Angelos, formerly the United States revenue steamer Wyanda. With its old machinery, the Wyanda made nine lars! Ay, and "warranted" too-a god of wealth "sure to makee glow riche," says the coal. The contract made with California mapolite vender; gods of fair weather and chinists required that with the new engines it guardians of health; gods for the sailor and should make 9% knots on a consumption of for the farmer-for every condition of life, nine tons of coal, and on its trial trip the vesevery emergency, and at all prices. Among sel made ten knots on a consumption of six the most attractive of the shors are the fruit tons of coal. In a round trip from San Franand flower stalls, usually adorned with pretty cisco to San Diego and back, the estimated savbird cages, while John Chinaman deals out his ing in coal amounts to \$800 in value, and bedainty wares, served in exquisite porcelain or side that, the new engine effects a saving of discover, the advantages resulting from commercial crises.

Since my last, pallida more—or, in the vernacular, grim death—came very near putting a period to your highly valuable and interests of your readers, postponed the performance to a more suitable and future occasion, a concestant of the accommodating owner with his frosted mair and long wadded gown of dark silk.

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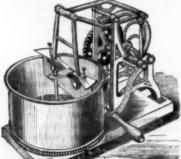
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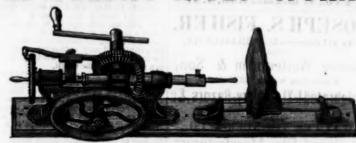
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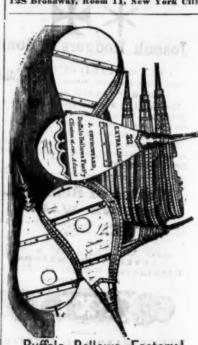
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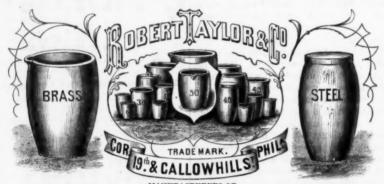
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France	6 00		00	1	50
Germany			00	2	06
Prussia	8 00		00		00
Buenos Ayres.	8 00		00	2	00
Peru	6 00		00	1	50
Belgium	8 00		00	2	00
Mexico	7 00		50	1	75
Sweden	12 00	6	00	3	00
New Zealand.	8 00	4	90	2	00
Brazil	6 60	3	30	1	65

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CONTENTS.

First Page.—Gang Saw Improvements. Cooking, Lighting and Heating with Liquid Fuel. Corrosion of Tin. Iron Industries of Rome, N. Y.—The Rome Merchant Mill.

Third Page.—The Franklin Iron Works. The Association of German Iron Masters. Stove Found-ing in Utica, N. Y. Fifth Page.—New Patents. The Cost of Liv-

Seventh Page.—Furnaces and their Construc-on and Management. A Curious Electric Phe-

Ninth Page.-Business Items

**Reventh Page.—Business Items.

Eleventh Page.—Philadelphia Correspondence.

What the Underwriters Demand of Chicago. Chinese Stores. Our Iron Industries in the Last Century. California Built Marine Engines.

**Fourteenth Page.—Railroad Legislation and the Iron Trades. Our Pig Iron Production. The Pittsburgh Calemity. Current Progress in the Improvement of the Machinery and Processes of Iron Manufacturing. Production of Pig Iron in the United States in 1872 and 1873.

United States in 1872 and 1873.

Fifteenth Page.—Production of Pig Iron in the United States in 1872 and 1873—(Concluded). General Regulations for American Exhibitors in the Centennial Exhibition. The Flood at Pittsburgh. The Flow of Water.

Mixteenth Page.—Improvements in Metal Roof-ng. The Pittsburgh Water Works. Reddish Brown.

Soventeenth Page.—Trade Report.

Eighteenth Page.—Trade Report—(concluded)

Nineteenth Page.—Our English Letter. The facilities in all directions.

Twentieth Page — Brick and Soapstone Stoves New England. Peat Faels and their Economic alue. Water Pipes and Frost. Twenty-third Page.—The Iron Age Directory.

Twenty-fourth Page.—The Iron Age Directory.

Twenty-fourth Page.—The Stevens Iron-Clad
Steam Battery. Weight of Metal Plates. Per Square
Foot. More Philadelphia Steamships. On the Melting Point of Fusible Alloys.

Twenty-sixth Page. -New York Wholesale Prices of Hardware and Metals.

Thirty-first Page.—Philadelphia, Buffalo, Cincinnati, and Detroit Hardware and Metal Prices. Thirty-third Page-Chicago, Boston, and St. Louis Hardware and Metal Prices.

Railroad Legislation and the Iron

Trades.

the question of securing cheap transportation by the characteristically American expedient of "Be it enacted," &c., taken in fested by Congress during the last session to have its share of the sweet and profitable privilege of legislation upon this subject, distant when an effort will be made to would be rapid and sustained—not so tremely improbable. More likely it nationalize our railroad system and give much, perhaps, in the building of long was one of those sudden down-pourings of dent from the tone of its discussions upon beneficial to its own interests, and the in- of thunder showers will probably recall

end and working backwards, has had the effect of leading many to believe that the subject would be much better legislated upon in Washington than in the several State capitals, between which no harmony of opinion or concert of action can resonably be expected. The effect of this agitation, coupled with the uncertainty which attends the future, has already had a marked influence in discouraging capital from seeking investment in railroad construction, and, so far as railroad building is concerned, we can expect to see but little progress in States in which the "granges" are power in politics, until the question of who is to control railroad management is settled one way or the other.

Hitherto the iron trade has had but little to say on this subject. The only expression in a resolution adopted at a meeting of which we took exception at the timework of completing two unfinished Pacific railroads. About the danger to the trade, and to the whole country, of further legislative interference, State or national, with nothing to say, and we think it is time they spoke on the subject. How large a proportion of the iron product of the country has gone into railroad construction and equip- year 1873, 50 more were built, making the ment during the past five or six years, total number of stacks in the country at those of our readers who are interested in the beginning of the current year, 662. been a main dependence in the past, and January. By the 1st of July, instant, the and almost reckless speculation in railroad 61, but while this may be approximately corlast fall, men did not stop to weigh the value. The estimated capacity of finished their investments. This is shown by the 000 net tons per annum: the product in the strength of promises so extravagant that be found to believe them. This dependence failing with the gradual weakening of public confidence, the work was pushed on even more recklessly, and when the panic came it was found that for months we had been building railroads with call loans call, had been locked up in permanent investments which could not reasonably be expected to pay interest for years, if ever. The lesson of the panic was too bitter to be soon forgotten. Capitalists have not lost faith in good railroads, economically constructed and well managed; but they are no longer disposed to invest with their eyes shut, and they see dangers ahead from State and Congressional interference which they did not sec-or, at least, did not heed-a year ago. No one who considers the subject calmly is willing to put his money into a business the control of which may be wrested from him at any time by a body of men who represent the wishes of the people, while ignorant of, or indifferent to, their best interests; and so long as this uncertainty exists, so long may we expect to witness slow own progress in railroad building, even though the requirements of our internal commerce demand the extension of transportation

encouragement of railroad extension and it is difficult to find a parallel for it. Fifty the improvement of our internal water years ago the city of Catskill, on the Hudthe privilege of forwarding merchandise The continued agitation in the West of capital or not. In this country no monoconnection with the evident desire mani- management untrammeled, the question of which, under such abnormal conditions, than it ever will under legislative guidance. warrants the belief that the time is not far In the meantime, our railroad progress public, or anything resembling it, is ex-Congress-or, more properly, allow Con- trans-continental lines, as in the construcgress to assume—the extra-constitutional tion of short connecting and competing and which differ from ordinary thunder those already in operation. That Congress To what extent the iron trade could be in- given, warrants this belief, and those who has long desired to wield this power is evi- strumental in bringing about a result so have carefully observed the phenomena

transportation by beginning at the wrong unmistakable expression, and we hope the and practical christianity which are emi- | Production of Pig Iron in the United earliest opportunity for doing so will be improved.

Our Pig Iron Production.

In another column we publish an ineresting and valuable statistical statement of the production of pig iron in the United States in 1872 and 1873, compiled from returns made directly to the American Iron and Steel Association, by Mr. James M. Swank, secretary. The fact that they are compiled from returns thus made would not give them any great value in itself, for very unreliable statistics are often made from very excellent and complete data. Those who know Mr. Swank, however, do not need to be assured that he is a thorough and painstaking officer, whose finished work will always bear the test of critof opinion which we now recall was given | ical examination. During the past two years he has devoted himself to statistical iron masters some months ago-and to compilation with zeal and intelligence, and, with the superior facilities afforded by his recommending Congress to assume the position, he has given us figures which, if not accurate in every detail, are as nearly correct as the statistics of a great industry can be made. We congratulate the Association on having an officer in the responsible railroad management, the iron masters of position of secretary so well qualified by the country, so far as we know, have had nature and experience to discharge its difficult duties.

The statements shows that during 1872, 41 stacks were built, and that during the the subject'do not need to be told. It has Of these 410 were in blast on the 1st of on it rests in great measure the hope of a number of completed stacks had increased prosperous future for the iron trades of to 673, and 58 more were building. The the country. During the season of wild number projected at that date is set down at building, which culminated in the panic of rect, the estimate is of comparatively little chances and nicely calculate the profits of stacks on the 1st of July, instant, is 4,500, fact that many millions were raised upon net tons is given as 2,854,558 in 1872, and 2,868,278 in 1873. The value of the prot now seems strange that any one could duct is estimated as follows: 1872, \$132, 649,621, averaging a little over \$40 per ton ; 1873, \$118,243,308, averaging about the

same price. In his figures of consumption, Mr. Swank states the reasons why it is impossible to keep an accurate record of this imwhich, instead of being held subject to portant item, and gives the method by which he has reached his estimates. It is to add the annual production to the amount imported during a given year, the presumption being that stocks remain about the same, or so nearly the same that their increase and decrease are not noticed. This method of calculation gives us a consumption in 1872 of 3,150,525 net tons, and in 1873 of 3,023,058 net tons. The details of the statement, which present a statistical history of pig iron production in the United States since 1810, will amply repay careful reading, and will be found valuable for reference.

The Pittsburgh Calamity.

The disastrous sterm which swept down upon the cities of Pittsburgh and Allegheny, on Sunday evening, an account of which is given on another page, is an event which calls for the expression of sincere sympathy for those who suffered from its ravages. Such a calamity is one against which no human In our judgment, the only permanently foresight could have guarded. The storm, satisfactory solution of the question of if not unprecedented in fury, was a phecheap transportation must be found in the nomenon so unusual in these latitudes that ways until there shall be a competition son River, was deluged, fifteen inches of among carriers for freights, and not, as rain having fallen in about seven hours, Twenty-seventh Page. New York Wholesale now, a competition among the shippers for causing every mountain stream to swell to market on such terms, and under such ward rush. A few years ago a flood in conditions, as carriers may impose. Cer. the Patapsco Valley resulted from similar tainly this is a safer method of seeking the causes, and a like phenomenon is found in result than one which proposes to require the Nevada "water spout," of which acthe railroads to do business at fixed rates, counts were lately received. In the whether they return an interest upon the tropics such storms are of comparatively frequent occurrence, but in our climate polies can long exist which are not hedged they are so rare that no necessity exists round with legislature enactments, and if we for guarding against them, even in mounleave railroad building free, and railroad tain districts traversed by small streams, cheap transportation will work out its own expand into torrents of resistless power. solution much sooner and more certainly That it was a water spout, as some correspondents have hastened to inform the water commonly known as cloud-bursts, power of granting charters for new lines lines in populous sections, for which a storms only in degree. The account of and fixing freight and passenger rates for profitable traffic is certain to be secured. the appearance of the storm, elsewhere

nently characteristic of the times in which we live, the people of Western Pennsylvania have come to the relief of the suf fers with timely and generous aid. Prob ably there will be no call upon the people of other cities, for the number requiring relief is comparatively small; but had such a necessity existed, we are sure the re sponse would have been liberal, and that, as ever in the past, New York would have shared its abundance with those who should appeal for aid.

Current Progress in the Improvement of the Machinery and Processes of Iron Manufacture.

The department of "New Patents," which has long been a weekly feature of The Iron Age, is one which merits the careful and intelligent perusal of all who are connected with, or interested in, the manufacture of iron. The records of the Patent Office at Washington are not always entertaining and profitable reading, but when from those records are selected the drawings, specifications and claims of patents relating to a particular industry, they possess for the intelligent reader connected with that industry an importance which ought to be generally recognized. In the publication of patents relating to iron, we do not attempt to discriminate between the useful and the useless, the practical and the impractical. The fac that they have passed the examination to which they are subjected at the Paten Office is prima facie evidence that the in ventions embody something of novelty and presumably of utility. Probably no large proportion of them are really useful to practical iron masters, but there are very few which will not repay carefu perusal. In many cases they record the methods and results of careful experiment extending over long periods, and if the in ventor has patented something which doe not fully meet the want he has aimed to supply, he may have made a valuable contribution to progress in preparing the way for others who will take up the work where he has left it and carry it forward to a successful issue. Were we to attempt to decide, upon their apparent merits, which patents we should print and which omit our record of current progress would be in complete, and our judgment might ofter be at fault. As it is, we give all that we think will interest our readers. When the text cannot be understood without refer ence to the accompanying drawings, we have engravings made, thus presenting the patents complete and shorn of nothing but their unnecessary legal verbiage. must admit that we find in many of patents much to criticise, did time a space admit, but those which are wo less will soon be forgotten, while th which are useful and valuable will find ceptance on their merits.

Looking back through our files since beginning of the current year, we find t we have published patents relating to ne ly all departments of iron manufacture, cluding improvements in blast furnac puddling furnaces, fineries, steel mak and tempering, welding, case hardeni the direct reduction of ores to mallea iron, and about twenty other subject These patents indicate a current progr with which every intelligent iron mas should be familiar, and we are sure th nowhere outside the patent office can found so complete a record of inventirelating to iron as in the columns of ! Iron Age. We also publish, from time time, selected patents of interest to may facturers and dealers in hardware, in wh we aim to give the information in the m condensed form possible. We are glad have reason to believe that the departme of patents is a valuable feature of o journal, and that our enterprise in incurring the heavy expense involved in the reproduction of the drawings is generally appreciated.

From a report of the Austrian government on the Vienna Exhibition we gather, says the Academy, the following interesting particulars respecting the increase of means of communica tion in various parts of the globe during the last six years. Lines of telegraph wire have increased from 57,166 to 37,000 geographical miles, and a complete line now runs from San Francisco across the continent of America and the Atlantic, through Europe and Siberia to the mouth of the Amur on the eastern con fines of Asia, while branch lines connect India, Japan and Australia. The mileage of railways has increased during the same period from 24,000 to 37,300 miles; and a calculation has been arrived at that no less than four millions of people are daily conveyed by this species of locomotion. By means of the postal service it the subject; but public sentiment was not ripe for so long a step in the direction of centralization, and probably is not at this time. But it is certainly more favorable to such a change than it was a year ago, and he blundering of the state legislatures in tempting to solve the questions of cheap

States in 1872 and 1873.

Complete Returns from every State.

We present herewith full and accurate statistics of the production of pig iron in the United States in 1872 and 1873, derived from returns made directly to the office of the American Iron and Steel Association by the makers and by the regular correspondents of the association. This exhibit is the most complete of the kind that has ever been given to the country, and its preparation alone has cost the association thousands of dollars. We briefly summarize the leading facts set forth in the detailed statements which follow, premising them by remarking that our tables do not include aban-

trouble rurances .	
Whole No. of stacks, December, 31, 1871	571
Whole No. of stacks built in 1872	41
Whole No. of stacks, December, 31, 1872	612
Whole No. of stacks built in 1873	50
Whole No. of stacks, December 31, 1873	662
Whole No. of stacks in blast Jan. 1, 1874	
	410
Whole No. of stacks out of blast Jan. 1, 1874	256
Whole No. of stacks completed in first 6	
months of 1874	11
Whole No. of finished stacks, July 1, 1874 .	673
Whole No. of stacks building, July 1, 1874	
Whole No. of stacks building, stry 1, 1814.	53
Whole No. of stacks projected, July 1, 1874	61
Total production in 1872, tons of 2000 lbs 2,850	,558
Total production in 1873, tons of 2000 lbs 2,869	278
Estimated annual capacity of all finished	ducer
stacks, net tons	000
No. of States having furnaces	4,000
No. of States naving ternaces	25
No. of States making pig iron in 1872	21
No. of States making pig iron in 1873	22

PRODUCTION OF PIG IRON IN 1872 AND 1823

	-	_		AS .	. 01	LAX.	90.			
STATES.	No. of stacks in blast, Jan. 1, 1874.	No. of stacks built in 1872.	No. of stacks built in 1873.	Whole No. of stacks in 1872.	Whole No. of stacks in 1873.	Whole No. of stacke, July 1, 1874.	No. of stacks building in 1874.	No. of stacks projected in 1874.	Make in 1872—Tons of 2000 lbs.	Make in 1873-Tons of 2000 lbs.
Maine Vermont Mass Conn N. Y	1 1 5 8			1 2 6 10		1 2 6 10			2,000 17,070 22,700	780 3,100 21,136 26,977
N. J Penn	166	2 19	1114	19 248	13 262	13 283	18	1 15	291,155 103,858 1,401,497	
Md Virginia. N. C S. C	17 13 3	2	8	32 7	22 35 8	36	4	1 1 9	63,031 21,445 1,073	55,986 26,475 1,432
Georgia Alabam a	6 7		9 8	8 6 8	8 8 11	12	3	1 8	2,945 12,512	7,501 22,283
W. Va	5 16	1	i	5 25	1 6 25		3	8	619 20,796 67,396	280 28,056 69,889
Tenn Ohio Indiana .	11 65	1 6 2	1 5	19 88	20 88	20 88	8	7 9	42,454 399,743	48,134 406,029
I linois	1 19	4 1	9 6	8 87	8 10 33	34	2	6	89,221 78,627 100,222	32,4% 55,796 123,506
Wis Minn	7		3	10	18	14			65,036	74,148
Missour i Oregon	10	1		14	18	18			101,188	85,552
Total	410	41	50	612	662	673	58	61	2,854,558	2,868,278

CHARCOAL

the and oth-ose ac-	STATES.	No. of stacks in blast, Jan. 1, 1874.	No. of stacks built in	Whole No. of stacks in	Whole No. of	Whole No. of	No. of stacks building in 1874.	No. of stacks projected in 1874.	n 1572—Tons of 2000	Make in 1973-Tons of 2000 lbs.
ing ng, ble ets. ess ter hat	Maine Vermont Mass Connecticut New York Penn Maryland Virginia N. Carolina S. Carolina Georgia Alabama Texas	1	1 . 2 1 . 2 3	15 38 14 30 8 7	5 10 17 39 14 32 8	10 17 39 14 33 8	2 1	1 1	2,000 12,820 22,700 19,812 45,033 26,044 21,445 1,073	15,70 26,97 29,32 45,85 30,31 20,07 1,43
The to	W. Virginia. Kentucky Tennessee H. Rock. Misc Total.	3 14 10 83 2	1	32	4 22 17 33 4	28 17 33 4		9 30	950 39,699 34,094	1,95 42,21 84,53 93,36 8,13
ich ost to ent	Michigan Wisconsin Minnesota Missouri Oregon	18 2	2	22	28 10 9	29 11 1 9	-	6		113,47 88,88
our	Total		-	262	281	292	10	19	-	574,79

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Protection of the country of the cou

Ap of th States

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trade. ized, and I definit indust Henry

built in 1872. built in 1872. built in 1873. etacks in 1872. In 1873.

BITUMINOUS COAL AND COKE.

n			No. of	No. of	No. of	Whole	Whole?	Whole	No. of 8	No. of	Make It	Make
-	III.	Shena'go Val- ley Al'gh'y coun- ty	15	5	- 02	29	31	Si	-		160,188	
8	Per	Misc'llaneous	18	**	i	31	32	222	3		110,599 117,234	
a		Total	44	9	3	71	74	74	6	4	888,011	
f		ryland rginia rth Carolina				4			i	2	12,079	****
f t	Ke	est Virginia ntucky nnessee Hang. Rock. Mahon'g Val-	2000	1		0.65-00-00	-1888	07 + 83 t-	8 .2 5	8 :49	19,846 27,697 8,360 23,169	8,602 38,601
	Ohio.	ley Misclaneous.	14	3	13	27 13	28 16	28 16		7		119,040
1		Total	30	6	5	46	51	51	8	9	304,121	305,531
	11111	liana nois higan souri	`i 'i	2	2	8 8 3 7	8 10 3 9	9,		3	39,221 78,627 18,362 55,569	82,486 55,796 795 46,016
1		Total	88	20	18	154	167	168	22	26	946,918	988,900

				AN	TH	RAC	ITE				
	STATES.	No. of stacks in blast, Jan. 1, 1874.	No. of stacks built in 1872.	No. of stacks built in 1873.	Whole No. of stacks in 1872.	Whole No. of stacks in 1873.	Whole No. of stacks July 1, 1874.	of stacks building in 18	No. of stacks projected in 1874.	Make in 1872-Tons of 2000 lbs.	Make in 1873—Tons of 2000 lbs.
Ne	Lehigh Sch'ylkill U. Susque-	1 29 6 30 26	1288	- 22 1 82 83	1 84 12 44 87	1 36 18 47 40	1 36 13 47 41	4 4 6 4	3 1 4	4,250 271,343 103,858 449,663 232,225	5,432 267,480 102,341 889,969 236,409
Penns	L. Susque- hanna	14 24	3	4	25 38	37	25 37	1	4	127,260	129,804 157,403
	Total	94	10	10	139	149	150	12	12	968,458	913,665
Ma	ryland	4			4 1	4	5			21,908	20,407
	Total	185	10	10	191	201	200	40	10	1,869,812	1,812,754
_		VTI	770		777787		Y 4	WI		ve	
W	isconsin	1	1	1	2	3	2			87,246	85,268 8,786
Wi		1	i	1	1	3 1	1				25,268 8,736 44,004
Wi	lsconsin	1 1 2	i	1 1	3	3 1	8 1			87,246	8,786
Mi	lsconsin	1 1 2	i	1 1	3	3 1 4	8 1			87,246	8,786
Mi	isconsin Chigan Total	1 1 1 2 P	i i	1 1 T	2 1 1 3 ANI	3 1 4 4 CF	3 1 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	co	AL.	87,246	8,786
MI	isconsin Chigan Total	1 1 1 2 P	i i i	1 1 T	2 1 3 ANI	3 1 4 4 D CF	S 1 4	co	AL.	87,246 87,246	8,786
MI	sconsin Total	1 1 1 2 P	i i	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2 1 3 ANI 1	3 1 4 4 D CF	3 1 1 4 4 A RAR	CO	AL.	87,246 87,246	8,786
MI	isconsin	1 1 1 2 P	1 1 DAN	I I	2 1 3 ANII 1 1 ND	3 1 1 4 2 CE	TARIAR II	CO	AL.	87,246 87,246	8,786 44,000 500
Mi	isconsin chigan Total chigan chi	1 1 2 F	I I I	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2 1 1 3 ANII 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	3 1 4 4 D CF	1 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	CO INC	AL.	87,246 87,246 224 COAL	8,786 44,004 500 2,400 574,723 933,970
Mi Wi Ch	chigan Total CHA chigan CHA chigan ch	1 1 2 F	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2 1 1 3 ANI	3 1 4 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	1 1 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	CO INC	AL.	\$7,246 \$7,246 224 \$COAL. \$500,363 946,918 1,363,812	8,786 44,004 500 2,400 574,724 933,944 1,812,75
Mi Vi	isconsin chigan Total chigan chi	1 1 1 2 2 F	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2 1 1 3 ANI	3 1 4 4 5 CF 1 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 1 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	CO INC	AL.	87,246 87,246 224 COAL. 500,363 946,918	8,786 44,004 500 2,400 574,723 933,944 1,812,75 44,00

Pennsylvania, with 262 stacks, makes very nearly one-half of all the pig iron made in the Ohio comes next, making one-seventh of the whole product with 88 stacks. New York, with 53 stacks, makes over one-tenth of the whole product. These three States and New Jersey make more than three fourths of the total product. Five Western "prairle" States, Indiana, Illinois, Michigan, Wisconsin and Missouri, made thirteen and one-half per cent. of all the pig iron produced in 1872, and twelve and one-half per cent. of all made in 1873. It is a singular fact that South Carolina has eight charcoal furnaces and that not one of them was in blast in 1872 or 1873. The lack of capital to operate them, and the need of repairs are as signed as the reasons for their long suspension. Fuel and ore of an excellent quality are abund ant in their vicinity, and it is scarcely possible that they will all remain much longer out of blast. Two other Southern States, Alabama and Georgia, are making rapid progress in the manufacture of pig iron, for which they possess truly wonderful facilities.

The production of charcoal pig iron increased nearly 75,000 tons in 1873 over the product of 1872, while there was a decrease in the production of both bituminous and anthracite pig iron. In each year named the quantity of anthracite pig iron produced was nearly one half of the total product. The average annual product of the furnaces of the country, in net tons, is as follows: Charcoal, 2024 tons: bituminous coal and coke, 5592 tons : anthracite, 6435 tons.

the quantity of pig iron on hand and unsold in this country, from year to year, it is obviously impossible to ascertain accurately the consumption of pig iron in any given year, but a very close approximation can be made by adding the production in that year to the quantity imported. Observing this method, we have the following

results for 1872 and 1872, net
Home production of pig iron in 1872, net
2,854,558
295,967 Pig iron imported in 1872, net tons...... Total consumption of pig iron in 1872, net Total consumption tons in 1873, net Home production of pig Iron in 1873, net 154,780 Pig iron imported in 1873, net tons...... Total consumption of pig iron in 1873, net .3,023,038

In 1872 and 1873 our exports of pig iron to all countries (principally to Canada,) were as follows; in 1872, 26,380 cwts.; In 1873, 180,486 cwts. A year ago much was said in public journals of alleged shipments of pig and bar iron to Great Britain, but the most diligent inquiry fails to show that such shipments were ever made, although, as has heretofore been remarked, it is not improbable that English and Scotch founders will yet require large quantities of our charcoal iron for car-wheel purposes. This want, however, will not be created until the American method of making car-wheels becomes more popular in Great Britain than it now is. The British car-wheel, as at present constructed, is not composed, in whole or in part, of charcoal

Appended is a table showing the production of the various kinds of pig iron in the United States from 1854 to 1873, both years inclusive. It is compiled from statistics procured by this ssociation. Prior to 1854 no agency existed for the collection of the statistics of the iron trade, but in 1855 this association was organized, and since then it has regularly collected and published these statistics. All that is definitely known of the progress of the iron industry in this country prior to 1854 is embraced in a statement prepared by the Hon. Henry C. Carey, in 1849, and this statement we also append:

PRODUCTION OF PIG IRON FROM 1854 TO 1873.

Years.	Anthracite	Charcoal.	Bituminous Coal and Coke.	Total.
854	339,435	342,298	54,485	736,218
1855	381,866	339,922	62,390	784,178
856	443,113	370,470	69,554	883,187
857	390,385	330,321	77,451	798,157
858	361,430	285,313	58,351	705,094
859	471.745	284,041	84,841	840,627
860	519,211	278,331	122,228	919,770
861	409,229	195,278	127,087	731,544
862	470,315	186,660	130,687	787,662
863	577,638	212,005	157,961	947,604
864	684,018	241 853	210,125	1,135,996
865	479,558	262,342	189,682	931,582
866	749,867	332,580	268,396	1,350,343
867	798,638	344,341	318,647	1,461,626
868	893,000	370,000	340,000	1,603,000
869	971,150	392,150	553,341	1,916,641
870	930,000	365,000	570,000	1,865,000
871	956,608	385,000	570,000	1,912,608
872	1,369,813	*50H,587	1984,159	2,854,558
1873	1,312,751	\$577,620	9977,904	2,868,278

fincludes 37,246 tons of mixed anthracite and

oke pig iron.

§ Includes 500 tons of mixed peat and charcoal pig
ron, and 2400 tons of mixed charcoal and bituminous
Specia iron. udes 44,004 tons of mixed anthracite and oke pig iron

MR. CAREY'S PIG IRON STATISTICS.

In 1810 the whole number of furnaces in the Union was 153, yielding 54,000 tons of metal, equal to 16 pounds per head of

the population.
In 1821 the manufacture was in a state of ruin.
In 1828 the product had reached 130,000 tons, having little more than doubled in

having little more than doubled in eighteen years.
In 1829 it was 142,000. Increase in one year, nearly ten per cent.
In 1830 it was 165,000. Increase in two years, more than 25 per cent.
In 1831 it was 191,000. Increase in three years, about 50 per cent.
In 1831 it was 191,000, Increase in three years, about 50 per cent.
In 1832 it was 200,000, giving an increase in three years of above 60 per cent.
In 1840 the quantity given by the census was 286,000, but a committee of the Home League, in New York, made it 347,700 tons. Taking the medium of the two, it would give about 315,000 tons, being an increase in eight years of 50 per cent.

In 1842 a large portion of the furnaces were

In 1842 a large portion of the furnaces were closed, and the product had fallen to probably little more than 200,000, but certainly less than 230,000 tons.

In 1846 it was estimated, by the Secretary of the Treasury, at 765,000 tons, having trebled in four years.

In 1847 it was supposed to have reached the amount of not less than 800,000 tons.

amount of not less than cov, or tall.

In 1848 it became stationary.
In 1849 many furnaces being already closed, the production of the present year cannot be estimated above 650,000 tons; but from the accumulation of stock and the difficulty of selling it, it is obvious that the diminution will be greater.

In the twenty years ended with 1873 the States as compared with that of the United Kingdom of Great Britain was as follows: The ton used in the statistics of the United Kingdom is the gross ton of 2240 pounds; that used in the statistics of the United States is the net ton of 2000 pounds.

Year.	U. King. Tons.	U. S. Tons.	Year.	U. King. Tons.	U. S. Tons.
1854	3,069,838	786,218	1864	4,767,991	1,135,996
1855	3,218,151	784,178	1865	4,819,254	931,582
1856	3.586,377	883,137	1866	4,523,897	1,350,343
1857	3,659,477	798,157	1867	4,761,028	1,461,626
1858	3,456,064	705,094	1868	4,970,206	1,603,000
1859	3,712,904	840,627		5,445,757	1,916,641
1860	3,826,752	919,770	1870	5,963,515	1,865,000
1861	3.712,390	731,544	1871	6,627,179	1,912,608
1862	3,943,469	787,662		6,741,929	2,854.558
1863	4.510,040	947,604		6,850,000	2,868,278

The value of the pig iron product for any year can be approximately ascertained by multiplying the average market value throughout the year of each kind of iron by the year's product, and adding the results thus obtained. In this manner we have carefully calculated the value of the pig iron manufactured in this country during the years 1872 and 1873, and find it to be as follows:

In 1854 the production of anthracite pig iron overtook that of sharcoal, and in 1869 the production of charcoal pig iron was again over taken by that of bituminous coal and coke. Since 1854 anthracite has been the leading branch of our pig iron industry, and since 1869 charcoal has been the least productive of all branches .- Bulletin Iron and Steel Association.

General Regulations for American Exhibitors in the Centennial Exhibition.

We have received the following from the office of the Centennial Commission, Philadel phia:

The exhibition will be held at Fairmount Park, in the city of Philpdelphia, and will be opened on the 19th day of April, 1876, and closed

on the 19th of October following. The ten departments of the classification which will determine the relative location of articles in the exhibition-except in such collective exhibitions as may receive special sanction-and also the arrangement of names in the

catalogue, are as follows : I. Raw materials-mineral, vegetable and an-

II. Materials and manufactures used for food, or in the arts, the result of extractive or com-

bining processes. III. Textile and felted fabrics; apparel, cos tume and ornaments for the person.

IV. Furniture and manufactures of general use in construction and in dwellings. V. Tools, implements, machines and pro-

VI. Motors and transportation.

VII. Apparatus and methods for the increase nd diffusion of knowledge. VIII. Engineering, public works, architec

ture, etc. IX. Plastic and graphic arts.

X. Objects illustrating efforts for the im-

moral condition of man.

Applications for space and negotiations rela tive thereto should be addressed to the Director General, International Exhibition, Philadelphia,

Exhibitors will not be charged for space.

A limited quantity of steam and water-power will be supplied gratuitously. The quantity of each will be settled definitely at the time of the allotments of space. Any power required by the exhibitor in excess of that allowed will be furnished by the commission at a fixed price. Demands for such excess of power must also be settled at the time of the allotment of space.

Exhibitors must provide, at their own cost, all show cases, shelving, counters, fittings, etc., which they may require; and all counter shafts, with their pulleys, belting, etc., for the transmission of power from the main shafts in the Machinery Hall. All arrangements of articles and decorations must be in conformity with the general plan adopted by the Director

Special constructions of any kind, whether in the buildings or grounds, can only be made upon the written approval of the Director General.

The commission will take precautions for the safe preservation of all objects in the exhibition; but it will in no way be responsible for damage or loss of any kind, or for accidents by fire or otherwise, however originating.

Favorable facilities will be arranged by which xhibitors may insure their own goods. Exhibitors may employ watchmen of their own choice to guard their goods during the hours the exhibition is open to the public. Appointments of such watchmen will be subject to the approval of the Director General.

Exhibitors, or such agents as they may designate, shall be responsible for the receiv ing, unpacking, and arrangement of objects, as well as for their removal at the close of the exhi bition

The transportation, receiving, unpacking and arranging of the products for exhibition will be at the expense of the exhibitor.

The installation of heavy articles requiring foundations should, by special arrangement begin as soon as the progress of the work upon the buildings will permit. The general reception of articles at the exhibition buildings will commence on January 1, 1876, and no articles will be admitted after March 31, 1876.

Space not occupied on the 1st of April, 1876 will revert to the Director General for reassign ment.

If products are not intended for competition it must be so stated by the exhibitor; and they growth of the pig iron industry of the United will be excluded from the examination by the International Junes.

If no authorized person is at hand to receive goods on their arrival at the exhibition building, they will be removed without delay, and stored at the cost and risk of whomsover it may

Articles that are in any way dangerous or offensive, also patent medicines, postrums, and empirical preparations whose ingredients are concealed, will not be admitted to the exhibi-

The removal of goods will not be permitted prior to the close of the exhibition.

Sketches, drawings, photographs or other r productions of articles exhibited, will only be allowed upon the joint assent of the exhibitor nd the Director General; but views of portions of the building may be made upon the Director General's sanction.

Immediately after the close of the exhibition exhibitors shall remove their effects, and com olete such removal before December 31, 1878. Goods then remaining will be removed by the Director General and sold for expenses, or otherwise disposed of under the direction of the commission.

Each person who becomes an exhibitor thereby acknowledges and undertakes to keep the rules and regulations established for the government of the exhibition.

Special regulations will be issued concerning the exhibition of fine arts, the organization of international juries, awards of prizes, the sale of special articles within the buildings, and on other points not touched upon in these preliminary instructions.

An official catalogue will be published in four stinct versions, viz: English, French, German and Spanish. The sale of catalogues is re served to the Centennial Commission.

Communications concerning the exhibition should be addressed to "The Director General, International Exhibition, 1876, Philadelphia. Penn."

The Centennial Commission reserves the right to explain or amend these regulations, whenever it may be deemed necessary for the interests of the exhibition.

A. T. GOSHORN, Director General. JOHN L. CAMPBELL, Secretary.

ADDRESS OF THE BOARD OF FINANCE. To the People of the United States: Arrange. nents are steadily progressing for the Centennial Celebration and International Exhibition. The principal buildings are in course of erection. The President of the United States, as requested by Congress at its last session, has extended a cordial invitation to all other nations to join you in this work, and a large number of these have already signified their intention to accept that invitation. Exhibition space is being applied for from this and foreign countries, and every manifestation on the subject seems to indicate eminent success for our centennial display. But to carry out this undertaking on a scale due to the glorious event to be ways leading thereto have yielded up a harvest commemorated, additional funds will be needed; for, while Congress has cheerfully thrown around this patriotic work the national lars and details: prestige, and promptly promoted it by appro-

provement of the physical, intellectual and past and the blessings of the present, you will news generally, it fell short of rather than becheerfully perform it, and to the end that it may youd the truth. It was soon known that ceradopted a plan for raising a revenue, which had been lost, and that much property had been will be brought before you by the bureau cre- destroyed or impaired in value; but it was not ated for that purprse, and acting under the until the next day that the extent and nature general direction of the Hon. Wm. Bigler, a of the disaster were at all comprehended, and member of this board, who is commended to even now the former is not fully determined. your respectful consideration in the perform- There was a hard rain in Pittsburgh on Sunday. ance of his arduous duties. In addition to the and on the evening of that day the streets were use of this plan, any person can subscribe for flooded, but not more than they have been be one or more shares of Centennial stock, at \$10 fore, and not enough to excite the appreheneach, by remitting payment for the same in sions of any but the closest observers. Nor post office drafts, or by check, to Frederick was there in Allegheny City, any alarming pre-Fraley, treasurer, No. 904 Walnut street, Phila- monition of the deluge; but a few miles northdelphia, for which certificates will be promptly JOHN WELSH.

President Centennial Board of Finance.

The Flood at Pittsburgh.

Great Destruction of Life and Property,

On Sunday evening Pittsburgh and Allegheny City were visited by a terrible calamity in the shape of a flood. The prevailing theory is, that the cause of the disaster was the bursting of a water spout, though other opinions are The water descended in vast torrents, and in the twinkling of an eye the streets were flooded. Hundreds of houses were swept away, and over 200 persons were drowned. The value of the property damaged and destroyed is variously estimated at from \$800,000 to \$1,000,-000. The following account of the storm is furnished by a correspondent writing from Pittsburgh, under date of July 27th:

"Never in the history of this city was there ever anything so terrible as the incidents of the flood of Sunday night. Not until to-day did the public realize what an awful destruction of life and property had occurred. The morning papers mentioned the death of 18 ersons only. This was probably owing to the fact that the storm continued all night in a modified form, and two reporters who first ventured into Allegheny City came near being drowned in the bursted sewers. But to-day, when the dull, dreary morning broke through a drizzling rain, a great cry of horror ran through the sister cities. As early as 6 o'clock it was said that not less than four hundred people had lost their lives at Butcher's Run. Spring Garden avenue, Madison avenue, Wood,s Run and Saw-mill Run, representing nearly the cardinal points of the compass of the two cities. By 7 o'clock the streets of both cities were filled with people rushing toward the various cenes of disaster.

"A description of the appalling storm, or vater spout, whichever it may be called, should not be out of the way, although it would be impossible to draw even a faint picture of the awful original. At about 634 o'clock on Sunday evening two great black clouds came up from opposite points of the compass, one to the southwest and one to the northeast. They rose slowly like two awful demons. Their edges were ragged and black, flecked here and there with patches of flery colors. A dozen little promontories jot- flow together and go on toward the Allegheny, ted out here and there, changing shape and appearance every moment, assuming the apearance of bird, or beast, or monster; occasionally extending far up across the intervening space as though to reconnoiter the enemy, and then again receding. But all this time the two great giants swathed in inky blackness, and almost without outline, slowly approached each other. Suddenly a noise burst from each. There was no distinct detonation like ordinary thunder, but a low, terrible, and continuous rumbling growl, causing the sir to vibrate and the earth to shake as though an ague had siezed it. A fringe of fire began to run along the ragged edges, faint at first, but growing n intensity every moment, until it looked as though the two demons had put on an armor of fire. On they came, nearer and nearer, when suddenly a mighty bolt of blinding light leaped from northeast, burned high up in the sky, and then fairly struck the opposing cloud. A moment and a deafening crash divided the bot atmosphere and made the earth tremble palpably.

"This was the opening of the grand battle. The long lines of flames that enveloped the two storm clouds ceased to dance and flicker, and below. There was not however great destruc gathered into tongues of silver and blue fire, and leaped forward simultaneously from both directions, until the rapidly narrowing space between them seemed to be an ocean of fire. The two clouds met directly over the city, and eemed to rock the earth to its uttermost foundations. For a few minutes previous a few heavy drops of rain had been puttering down, but when the two clouds met it seemed as though a river had been unchained in the heavens, and was falling bodily to the earth below. For half an hour it did not min. There was no distinguishable drops, as the term is generally understood. It was the descent of a torrent, like a river leaping over a precipice. In three minutes after this terrible water spout had burst more than 100 human beings were swept away. Down Madison avenue, Allegheny, came the flood in its most awful destructive ness, sweeping away more than 50 dwelling houses, and causing the death of 70 persons in that immediate vicinity. At Wood's Run, on the Ohio, 15 were swallowed up in the twinkling of an eye, and at Saw Mill Run, on the South bank of the Monongaheia, 25 more were suddenly ingulfed. The three rivers have been full of the dead all day, while the waterthat sickens co. overs and undertakers.

The following letter gives additional particu-

PITTSBURGH, July 28.-Although the news of priate laws, it did not furnish the necessary the terrible calamity which visited Allegheny capital. That part was left to you, and not City on Sunday night reached Pittsburgh with doubting that, inspired by the memories of the the proverbial speed of evil tidings, unlike such i

convenient for you to do so, we have tain streets had been flooded, that several lives ward one of those water spouts of which everybody has heard, but which so few have seen. descended in fearful reality. The clouds dis charged their contents in one vast sheet upon the range of hills overlooking the cities of Allegheny and Pittsburgh, and wearing deep gullies in the steep hillsides, found in the valley natural channel resembling in many points the narrow gorge down which swept only a few veeks ago the flood from Mill River dam on its way to Williamsburgh.

> In this instance the gorge lies between what cems to be known as Troy and Butcher Run Hills. In it, as it approaches the city, were two narrow streamlets, heretofore so harmless that they have not even been bridged, and which the streets hitherto crossed or followed without danger of overflow. Indeed, the names Spring Garden Run and Butcher's Run have been applied more to the streets than to the insignifiant streamlets which run in the same direction, Wood's Run was, perhaps, larger than the others, but it was never considered a stream of either dignity or power. But, swollen by the contributions from the hilltops on Sunday evening, they all expanded into torrents of fearful width, speed and strength. Butcher's Run first manifested its dangerous tendency near the house of Mr. Frank Metz, about 21/2 miles from Ohio street, and immediately afterward it struck and dashed to pieces a new frame building in which lived the family of a Mr. Mattern. Then gathering new strength as it ran, it burst upon Mr. Remkept's house and swept it away with the lives of four of its inmates, Mr. Remkept and his three small children

> A considerable distance further on, Madison avenue and East street come together, and the stream, dividing, ran down each, with depth and width enough to flood all the cellars, and with strength enough to lift houses from their foundations and either dash them to fragments or carry them bodily far from their original location. Meantime men, women aud children were drowned as the water reached them, and every dumb animal in the path of the torrent shared the same fate. East street lost six or seven houses with their contents, but Madison avenue became the bed of the new river, and here was wrought the greatest destruction. The pavement and soil of the avenue were scooped out to a depth of about 15 feet, while the houses were either flooded, overthrown or wreckedbut many of the people unaccountably escaped -until Vista street was reached by the flood. Below this, Butcher's and Spring Garden Runs and in this vicinity, to judge from the disordered and shapeless mass of debris, the greatest damage to property was done, although much of the debris here to be seen was probably brought down from above. The local papers state that here also was the greatest loss of

I have not traced the career of the Spring Garden Run because, although the incidents were different, it rose in the same manner, and its course and general results were about the same. The track of each stream was marked by terror and devastation, and as they came together devastation seemed to reach its climax. Many occupants of houses struck by the flood escaped by fleeing to the second stories, or getting on the roofs; but if the house went to pieces, or fell over, the fate of these fugitives was no better than that of those who were drowned on the ground floor, or while blindly rushing into the street for safety. The flooding of Wood's Run produced the same general results described above. The course of this torrent was a mile long, beginning at the junction of Western avenue and the Beaver road, and ending only at the river, which is about a mile tion of life in the region thus flooded, probably because it was sparsely settled; still, many per ished. Here, as elsewhere, men, women and children are gathered to mourn their dead, or to rake over the wreck in the vain search for property destroyed or swept forever beyond their reach.

The Flow of Water.

The following table will be found useful for reference in calculating the velocity of flow of water due to heads of 40 feet and under:

VELOCITIES, IN FEET, PER SECOND, DUE TO HEADS FROM 1 TO 40 FEET.

Head.	Velocity.	Head.	Velocity.	Hoad,	Velocity.	Head.	Velocity.
0.	0.00	10-	25:36	20.	35.86	30.	43.92
0.2	5'67	10.5	25.98	20.5		(30.2	44.29
1.	8.03	11.	26.60	21.	36.75	31.	44'65
1.2	9*82	11.2	27.19	21.2	87'18	31.2	45'01
5.	11.84	13.	27.75	20.	37.61	33.	45'37
2.5	12.68	12.5	28'35	22.2	38.04	35.2	45.72
1.		18	29.91	23.	38 46	98.	46.07
3.5	15 00 16 04	13.5	29.46	23.5	88.88	33.2	46.43
1.5	17'01	14.5	30.00	24.	39-29	34	46.76
. 9	17.93	15.	30.21	24.5	39:69	34.5	47.10
5.5	18-81	15.5	31.06	25	40.10	32.	47'44
	1964	16.	35.08	56.2	40.50	35.5	47.78
-5	20:44	16.5	32.28	26.5	40.89	36.2	48 12
	21.22	17	88.06	27	41.67	37	48:45
-5	21.96	17.5	33.22	27.4	42.05	37.5	49 11
	22.68	18	34.02	29	49.44	38	49.44
-5	23.38	18.5	34.49	28.5	42.81	38:5	49.76
10	94:06	19	34.96	29	48.19	39*	50.08
1.5	24-72	19.5	85'41	29.5	43.56	39.5	50:40
		1	-	1		.40	50.78

Improvements in Metal Roofing.

Mr. Samuel Taylor, of Birmingham, has pat ented "Improvements in Constructing and Fixing Sheet Metal Roofing," and his invention ap-pears to be singularly effective for the purpose named. It simplifies the work to be done, and at the same time adds immensely to the strength of the roof. The improvements are adapted to any kind of metal roofing, but are more especially appliable to zinc and galvanized iron The method of Mr. Taylor is, in constructing metal roofing, to make in the roofing plate two or more hollow ribs or projections open at bot tom, the said ribs or projections being at the same distances apart as the rafters to which the roofing is to be applied. The heads or dosed tops of the said hollow ribs or projections are angular, or nearly lozenge shape in cross section Upon the top of each of the rafters of the root is fixed, by means of nails or screws, a dovetail or angular metal seat, having in cross section a nearly triangular figure. This seat is made by taking a strip of sheet metal and bending its sides at an acute angle to the bottom or base. A base plate, which is fastened to the rafter, is thus made, provided with inclined sides constituting a dovetail or inclined seat, the inclined sides of the seat having a shape and size proper for the upper sides of the angular head of the hollow ribs or projections of the roofing plate to engage with. In fixing the roofing plates, made as described, to the roof, the angular shaped heads of the ribs or projections in the plates are engaged by a sliding motion with the fixed dovetail or inclined seats on the rafters, the seats being completely covered and protected by the heads of the ribs or projections. The roofing plates are prevented from rising vertically by the engagement of the angular shaped heads described with the fixed seats on the rafters, and from sliding off the seats by means of a flange on the end of each plate being nailed or otherwise fastened to the rafter The flange described at one end of each roofing plate is covered by the head of the rib or pro jection of the next roofing plate. By this method of constructing and attaching sheet metal roofing the parts used for connecting the plates to the rafters expand and contract equally, and the nails or screws used are concealed and protected from the weather by the connecting parts of the roofing plates. Where the roofing plates, made as described, cannot be engaged with the fixed seats on the rafters by sliding motion, the inventor engages the roofing plates with the seats before fixing the seats to the rafters, and after the engaged plates and seats have been put in their places he fastens the seats to the rafters by means of clips or connecting pieces prolonged below the base plate of the seats, the clips or pieces embrac ing the sides of the rafters, and being fixed to the rafters by nails or other fastenings.

The Pittsburgh Water Works.

Mr. Lowry, mechanical engineer of the new water works to supply the city of Pittsburgh, has prepared a very full and satisfactory statement of the amount of money required to complete the engines and boilers for the new water works, and the estimated cost of finishing the foundations at Negley's Run. From this statement it will be seen that it will require \$93,563 to take the first pair of engines off the hands of the contractor, and \$77,295 for the second pair-or \$170,858 for both. As there is a very heavy estimate on the second pair for next month, owing to the character of the work done, it is said that perhaps not more than \$35,000 could be saved by stopping work on them-even if the city attorney should be of opinion that the work can be stopped at all. As to the boilers, \$35,797.56 are required to be paid, making a total of \$206,655 to be paid on machinery when placed on the foundations.

The Pittsburgh Commercial says: The above figures are based upon contracts, and are definite. As to the foundations, or pumping works, the estimates show that a total of \$310,400 will be required, estimating for but one pumping main to Hiland avenue. Add to the latter figure the amount required to be paid on remainder of work on machinery, and to erect the same, \$255,215, and we have a total for this department of \$565,615. In this are included the amounts deducted for transportation and erection of the two pairs of engines.

The mechanical engineer, however, can cut down several of these estimates very materially. For instance, he can save on influent pipes \$9000; on bridge over Negley's Run, by dispensing with part of superstructure, \$20,000; and on engine house, by putting up a temporary covering, about \$55,000-a total saving of

In other words, if we understand the figures correctly, it will take \$296,655 to get the ma chinery out of the hands of the contractors and an additional sum, after cutting down the several items above enumerated, of \$226,400, to get the pumping works ready-making in all works, etc., were finished up, and the percentages paid, the sum total required would be \$726,690. This does not include the estimated cost of the fifty inch pumping main to Brilliant Hill reservoir.

This statement (a copy of which we append below) has no reference whatever to the reservoirs, as that department is under the supervision of Mr. Kennedy, the civil engineer. Under Dr. Gross' resolution, as passed by the water committee at its last meeting, it is pro- with water to the consistency of cream, and posed to suspend work in the larger compart- applied with a fine brush to the clean copper, ments of Hiland avenue and Brilliant Hill reser- and heated over a coal fire until the oxide voirs, and to push the smaller compartment of of iron adheres firmly. When cold the loose each to speedy completion; and also to sus- powder is brushed. The copper may afterpend work on the second pair of engines and | ward be hammered and beaten if the object is boilers for the same, if, in the opinion of the not yet finished. Or the object when painted city attorney, the city has the power under the may be held over the smeke produced by throwcontracts to so suspend.

and boilers, under the contracts made; but, as has been heated hot enough. The principal the second pair of engines are much nearer completion than was supposed, and as the saving would not exceed \$35,000, it is not so material to have this work stopped. The city attorney has not yet given his opinion on the matter, and until he does it is useless to specu-

There are but \$674,000 to the credit of the present knowledge extends, the work must stop at all points when that shall have been wide mouth vessel the coals are put inside expended. As has been shown, if the engines and boilers must be completed under the terms of the contracts, the machinery and pumping works department will require an office in the contracts. utlay of at least \$433,000. This will leave but \$241,000 to complete the reservoirs! The money to be paid to Wm. Smith on his pipe ontract, is put down at \$90,000, and the per centages reserved on machinery and reservoirs foot up \$228,522, according to the late state ment of Mr. Duff, secretary of the Water Commiltee. True, these reserves are not to be paid until the work is tested and found satisfactory but there ought to be money enough in the Water Extension fund to meet them. That there will not be, is plain enough, from the figures. The danger is, that the committee will go on spending until the fund is exhausted; and after an expenditure of \$4,500,000, the water works will be practically useless! "Four and a half millions spent, and no water!" will then be the cry. Let the Councils, and especially the Water Committee, guard against such a contingency as that. We have made the best use that we can of the figures placed at our disposal, and the Councils must devise a plan for avoiding such a calamity as we have fore shadowed, and which is not unlikely to happen unless the Waetr Committee take a bold and determined stand. The following are the

- 1	ngures in detail ;	
1	FIRST PAIR OF E	NGINES.
Л	Contract price of first pair of engines	\$423,560·00
1	and erection of machinery	23,560 00
П	Amount allowed the contractor for work completed in the shop Twenty per cent. withheld un- til acceptance of the work	400,000°00 80,000°00
L	Required to pay contractor for work done in the shop Amount paid on work	320,000·00 226,437·00
	Amount yet to be paid for work to be completed in the shop	93,563.00 NGINES
ı	Contract price of second pair of engines	
	Amount deducted for trans- portation and erection of machinery	25,000.00
ı	the shop	350,000.00

Amount yet to be paid for work to be completed in the \$170,858.02

Contract for steel and iron boil-Twenty per cent.withheld until acceptance of work..... Required to pay contractors for work completed in the shop Paid contractors..... To be paid for work to be completed in the shop..... 85,797 56

THE FOUNDATIONS.

Estimt'd expenditures required to complete foundations... \$ 60,000 00 Estimated cost of one pumping main to Hiland avenue reservoir... 118,000 00 Estimated cost of two check valves, two stop gates and branches. 8,000 00 Estimated cost of fire walls of boilers and doors. 3,800 00 Estimated cost of luffuent pipe Estimated cost of coll track. 4,000 00 Estimated cost of coll track. 4,000 00 Estimated cost of engine house 60,000 00

Twenty per cent. retained on 150,000 00 Twenty per cent. retained on

stimated cost of 50-inch pumping main to
Brilliant Hill Reservoir

255,215.58

Reddish Brown Coating for Copper.

There are several different methods of bronz ing copper or giving it a reddish brown Some of these are kept as trade secrets \$433,055. If the engines, boilers, pumping by copper workers. The tollowing is given by Rabe-Graf in the Industric Blatter:

1. German Method .- One ounce of pulverized horn, 4 ounces red oxide of iron, and 4 ounces pulverized verdigris are rubbed with vinegar to a fine powder and applied to the clean sursoft coal fire until the coating becomes dry or black. The metal is then washed and dried, rents at good prices. when the black turns to brown.

2. English Method.-Venetian red is mixed ing a piece of bitummous coal into a charcoal There seem to be grave doubts as to the fire. This smoke produces a spot on the copper, power of the city to stop work on the engines and when that begins to disappear, the metal

point is to strike the right degree of heat, which requires practice. If it be heated too much or too little, the copper must be cleaned again and operation repeated.

3. Chinese Method .- Two parts of verdigris 2 parts of cinnabar, 5 parts of salammoniac and parts of alum are finely pulverized and mixed There are but \$674,000 to the credit of the linto a paste with water or vinegar, then applied water extension fund, and, so far as our to the bright copper. The vessel is then heated evenly for a while over a coal fire. If it be a When cold it is washed, dried and a second coat applied, and so on until the desired color is obtained. The addition of sulphate of copper gives it more of a chestnut brown; borax, more of a yellow shade.

Special Notices.

Steam Engine Wanted Immediately.

A new or second hand plain, horizontal engine, about twenty-four inch cylinder by four feet stroke Box 2011, New York P. O.

Wanted.

A young man, familiar with the Cutlery Business to travel in Pennsylvania and New York State. One who has had experience in traveling in this section preferred. Address, giving references, salary required, section of country and length of time enaged in traveling, Office of The Iron Age, 10 Warren St., N. Y.

\$30,000 to \$50,000.

WANTED .- Additional capital in an Iron Fur ace Cempany, now in operation and making Pig Metal at a profit of \$8 to \$10 per ton at present prices A party who would take the active management of the business preferred; or the interest could be divided in \$5000 to \$10,000 shares. Present capacity of furnace, about 70 tons per week. With small ex nense the production can be doubled. Address,

A. B., Furnace Company, Office of The Iron Age, 10 Warren St., N. Y.

MAGNETIC IRON ORE.

Parties owning a valuable magnetic iron ore property of 150 acres on Lake Champiain—over 6000 tens of ore mined during 1873-desire to interest with them parties who can invest enough money to crect a first-class blust furnace. For details, address. G. G. S., Box 90, New York P. O.

\$20,000 to \$30,000.

A young business man wants an active interest to above amount in a money making business well established and capable of extension. He seeks either the place of a retiring or deceased partner, or an interest with one whose care and labor are so great that a younger partner is needed; or a share in a business the growth of which makes necessary new partner with additional capital. The advertiser has been brought up in a house well known for its high standing, and for the last few years he has had an active experience in the general management of business. References of the best class regarding personal character, business capacity, etc., will be given. Answers will be confidential, but those omitting name, business, etc., will have no notice. Address.

Office of The Iron Aye, 10 Warren St., N.Y...
Any house in Wholesale Hardware business re-

Any house in Wholesale Hardware business re

quiring an efficient person of long experience in the trade, in the capacity of Salesman, in or out of the

store, can be suited, by addressing, G.,

Office of THE IRON AGE, 10 Warren St., N. Y

Wanted.

A situation as superintendent of a rolling mill by a man who has a practical knowledge of Mer chant, Guide and Hoop Rolling, also of Pudding Understands Roll turning, Mill building and repair ing. Good reference given. Address, ALFRED COE,

219 Northampton St., Easton. Pa.

ASA SNYDER, Scotch and Anthracite Pig Irons. Furnace Agent and Dealer in the following oran

Cold Blast Charcoal Pig Iron.

Stonewall, Rehoboth, Derr, Calife, Ravenschiff, Cedar Run, Wythe, Eagle, Greenville, Walton, &c.

1008, 1010, 1012 & 1014 Cary St., RICHMOND, VA.

TO INVENTORS.

Patents secured in the United States and Europe, on the lowest terms and very

PROMPTLY, by A. V. BRIESEN, Solicitor of Patents and Attorney at Law in Patent Cases. 258 Broadway, N. Y., cor. Warren St.

EUGENE BISSELL, AUCTIONERS.

By BISSELL & CO.,

Store No. 94 Reade Street.

Our REGULAR SALES OF HARDWARE, CUT-LERY, FANCY GOODS, &c., will be held on TUES-DAYS and FRIDAYS throughout the season. CASH ADVANCES made on CONSIGNMENTS without additional charge.

Wanted.

ough business education. Has been come and mining interests in the highest capacing engineer and manager. Has been Manufacturing to and mining interests in the highest capacity as construc-ing engineer and manager. Has best of reference manufacturing interests of any kind, present or prospec-tive, preferred. Is not afraid of work. An inferior pos-tion will be taken. Salary nominal. Address, N. E. C. Office of The Iron Age, 10 Warren St., N. Y.

To Quit Business.

Will sell the best appointed Hardware Store Building in the State of Ohio, with or without stock. Doing a very large and satisfactory trade. No bonus face of the copper, which is there heated over a for the trade. Parties purchasing will have a good and satisfactory business from the opening. Property For particulars inquire of

JOHN E. BYRNE, 99 Chambers St., N. Y. JAMES C. JACOBS, Wooster, Ohio.

TO INVENTORS AND MANUFACTURERS

Special Notices.

WM. E. TANNER & CO., Metropolitan Works.

Steam Engines, Boilers and other MACHINERY, Canal St,, from 6th to 7th, Richmond, Va.

Canal St., from 6th to 7th, Richmond, Va.

In addit on to a full line of new engines, boilers, saw mills, and other machiners of our own manufacture, we have now on hand and will sell at very moderate rates.

3. Double Hoisting Engines, suitable for mining, tunnellings or other purposes. Each of these engines has two cylinders, 714 in. diam. by 18 in. stroke; two drums, 4ft. diam. by 4ft. long; geared to engine in proportion of 8 to 1, and are provided with disconnecting goar and friction brakes.

One 180 Horse-Power Stationary Engine, with heavy fly wheel, all complete, and nearly as good as new.

Three Return Tubular Boilers, (70 three inch tubes each), 15 feet long, complete with steam drum, fronts, valves, grates, &c., suitable for the above engine.

One 180 Horse-Power Portable Engine, of our own make, complete, with two driving pulleys. "Judoon" governor, &c. one 30 Horse-Power Portable Engine, with circular saw mill, saw and belt complete, in first rate order.

Three 4 Horse-Power Stationary Engines. Cylinder, 4 in. by 10 in.

One 30 Horse-Power Stationary Engine, as good as new, complete, with "Judson" governor, fly wheel, &c. One 30 Horse-Power Stationary Engine, in good running order, but not as new as the above.

One 16 Horse-Fower Stationary Engine, with new vertical boiler.

One 16 Horse-Fower Stationary Engine, with new vertical boiler.

One 16 Horse-Fower Stationary Engine, with new vertical boiler.

One 16 Horse-Fower Stationary Engine, with new vertical boiler.

One 16 Horse-Fower Stationary Engine, with new vertical boiler.

One 16 Horse-Fower Stationary Engine, with new vertical boiler.

One 16 Horse-Fower Stationary Engine, with new vertical boiler.

One 16 Horse-Fower Stationary Engine, with new vertical boiler.

One 16 Horse-Fower Stationary Engine, with new vertica bolier.
One Otla Hoisting Engine, in good order.
Two Fine Bohiers, 26 ft. long., 42 in. diam., each with two 14 in. flues, iron front, grates, &c., in good order.
One Fine Bodier, 36 ft. long, 48 in. diam. with two 14 in. flues, about as good as new grates, of our own make, used only a few months, and in perfect order.
Two No. 6 Sturtevant Blowers. Two No. 4 McKenzie Blowers. One No. 6 Andrew's Centrifugal Pump. One No. 6 Turbinate Centrifugal Pump. Three No. 0 Cameroon Pumps. One No. 2 Cameron Pump. One Knowle's Fump.
Thirty Brass Tubes, 1½ diam., 12½ ft. long. Send for illustrated catalogue and Price Lists.

This month a well known firm of Engineers and Machinery Agents, with large connections at home and abroad, will open a ground floor warehouse. having windows fronting Queen Victoria Street and Cannon Street, City, London, England. The firm is prepared to accept the agency for special machin ery, tools, &c., and to exhibit a choice selection of these, and of working models. Advertisers' travelers Canvass Great Britain and the whole of Europe. For terms, apply to W. P. L.,

Office of The Iron Age, No. 10 Warren St., N. Y. A. PURVES & SON,

Corner South & Penn Streets, Phila., Dealers in

Scrap Iron & Metals, Machinery, Tool Shafting & Pulleys, Steam Engines, Pumps & Boilers, Copper, Brass, Tin, Babbit Metals, Foundry Facings. Best Quality Ingot Brass.
Cash paid for alkinds of Metals and Tools.

THE CANADIAN BANK OF COMMERCE.

Capital - - \$6,000,000, Gold. Surplus - \$1,800,000, Gold.

The New York Agency, No. 50 Wall Street, buys and sells Steriing Exchange, makes Cable Transfers, grants Commercial Credits, and transacts other

J. G. HARPER, Agents,

To the Trade. HARDWARE TRADE REGISTER.

Owing to the backward state of trade occasioned by the late panis, we have deemed it advisable to defer the issue of our Trade Register until a later period than usual in order to give its cenedit to the trade of next season. It having come to our knowledge that certain parties, evidently having, no reputation of their own, are endeaved the state of the

The Merchants and Manufacturers Agency,

No. 14 Park Place, N. Y., Publisher.

CAUTION

No advance payments required for regular advertise-ments; but all small matter is payable in ad-vance. And our only authorized agents to collect memory are invariably provided with a certificate of au-thority, bearing our official seal, and signed by the manager, and are instructed always to give our printed receipt stamped with our seal and countersigned by the party receiving the money.

S W THOMPSON. Manager.

To Hardware Manufacturers.

An experienced Superintendent or Foreman ac-quainted with the manufacture of Brass and Real Bronze Hardware by machinery, and all details from the foundry to stock room, will be prepared to arthe foundry to stock room, will be prepared to arrange with responsible parties desiring his services August 1st. Can influence trade and give references as to shilly. Address office of The Iron Age, 10 Warren St., N. Y.

McHaffie Direct Steel Castings Co. STEEL CASTINGS,

Solid and Homogeneous, guaranteed to stand a Tensible Strain of 25 tons per square inch. An involumble substitute for expensive WROUGHT INON FORGINGS or for Iron Castings, where great strength is required. Office, cor. Evelina and Levant Sts..

PHILADELPHIA.
Send for Circular and Price List.

A. C. LESLIE & CO., Montreal, Canada.

Iron, Metal & Hardware Commission MERCHANTS & BROKERS. ufacturers or Merchants desirous of doing bus a Canada are invited to communicate with the ad

Wrought Iron Turnings.

WANTED .- Fine Wrought Iron Turnings V clean and free from grease. Three cents per ound will be paid for any quantity up to one hunoffice of The Iron Age, 10 Warren St., N. Y. dred tons. Address

Katahdin Charcoal Pig Iron.

O. W. DAYIS, Jr., Manufacturer, Portland, Me.
Furnace in Piscataquis County, Me., for Car Wheels,
Steam Criinders, Boller Plates, Hydraulic Presses, Plows,
Chilled Rolls, and any purpose requiring great strength.
South Falon Tests, Astahdin Fig Iron.
No. 3, density, 7-301 (tensie strength was quare in., 19,894
No. 4, "7-2305; "38,928
No. 4, "7-2305; "38,928
Shipped by rail or water from Bangor or Portland.
Samples and analyses furnished on application.

Special Notices.

MANUFACTURERS

desirous of introducing their goods to the British and Continental Markets, are advised to insert advertisements in the newspaper "IRON," pub lished every Saturday, at 99 Cannon Street,

SCALE: First 3 lines, 3/; every additional line, 10d. Price, 6d. per Copy, or 30/ per annum, inclusive of postage to the United States.

J. M. WHITE,

Architect and Constructor of Charcoal Blast Furnaces. Plans, Specifications and Eatimates of construction furnished upon application. Office address,

FON DU LAC. WIS.

for Sale, &c.

FOR SALE.

At Lowest Manufacturers' Rates. GUNS & SHEET ZINC.

Best German and Belgian Brands, By LOUIS WINDMULLER & ROELKER, 20 Reade Street, N. Y.



FOR SALE.

El. German consular instructions in English, published by subscriber, who translates from and into the English, Spanish. French and German. Latest translates German. Latest translates Government. Pacific Mail Steambilt Co. Walter A. Co., Tay Wheeler A. Co., Savannat; and the Tanite Co., Stroudsburg; by

C. KIRCHOFF. Commercial Editor "El Cronista."

Box 2806, N. Y.

IRON FOR SALE. **ULSTER BLAST FURNACE**

NAPANOCH, N. Y. mples and prices with,

M. M. PILLSBURY, 85 John St., N. Y.

Valuable Iron Works For Sale.

The undersigned offers for sale the Iron Works in Pottsville, Schuylkill County, Pa., known as "Th Washington Works," consisting of a

Large Stone Machine Shop & Foundry, Brick Pattern House, Erecting Shop, Stone Blacksmith Shop, Brick Office, and Lot of Ground containing in front 198 jee 3 inches, and in depth 260 feet.

There will be sold with the above a large and valunble collection of Patterns, Heavy Crane Flask and Heavy Core Spindles for making heavy Castin and Pipes of all sizes; Turning and Planing Too.

The Works can be put in immediate operation A favorable opportunity is here presented for enter prising men. The demand for Castings and Mach n ery is constantly increasing n this region. The propperty will be sold on liberal terms. If not sold in a reasonable time it will be for Rent. For particulars apply to

J. W. ROSEBERRY, Trustee,

a co

Since J

Inch

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Anvils.
Brass g
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Copper
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Nails.

Tm, 4378

once Jar

C. S. Curro B. S. 66 18 U. S. 66. 18 U. S. 1662. U. S. 5-20 1 U. S.

prices of a

FOR SALE.—AN UNFINISHED IRON, TWIN SCREW STEAM VESSEL, having double botom and water-tight compartments. Length between Perpendiculars

ENGINES.

Surface Condensers, area......12,560 aq. ft. SCREWS.

Type.
Total Heating surface......28,000 sq. ft. of New Jersey as an Ironclad. The plans were prepared and the work was carried on under the directi GEORGE B. McCLELLAN, U. S. A. All materials and the

description.

The funds appropriated for the purpose of completing the vessel not proving sufficient, the Legislature of the State of New Jersey has directed that a sale be made to the highest bidder. A Commission, consisting of His Excellency, Gov. JORL PARKER, of Trenton, Vice-Chancellor ARIL DODD, of Newark, Honorable Messrs. W. W. Shippin and S. B. Dod, of Hoboken,

Hoboxen,
has been appointed to effect such sale.
But a proper of the proposals for the Purchase of Indoor Strains of the Purchase of Indoor Strains of the S

signed.

Formission to examine the vessel, and to inspect the premises may be obtained (by intending purchasers) on application at the Dry Dock, where the ship now lies, or to the Consulting Engineer to the Commission, who will be prepared to exhibit drawings, to explain the structure of full and machinery, and to give any other information respecting the vessel.

the vessel.

R H. THURSTON,

Consulting Engineer to the Commission,

Hoboken, New Jersey,

United States of America

FOR SALE,

A valuable Iron property. Inexhaustible quanti-ties of rich ore. Twenty five hundred acres of wood land, valuable for farming lands when cleared. New charcoal furnace now in full blast. Can make as cheap iron as can be produced in the country.

Address, C. V.,
Office of The Iron Age, 10 Warren St., N. Y.

FOR SALE.

A well appointed **Hardware**, Stove and **Tin** establishment situated in a thriving village of Western New York. Satisfactory reasons given for wishing to sell. I will make it an object for a young man with a small capital to purchase.

Address. HARDWARE. Office of The Iron Age, 10 Warren St., N. Y.

Trade Report.

Office of THE IRON AGE.
WEDNESDAY EVENING, July 29, 1874.

The past week has been very dull in Wall street, and interest has centered in the Treasury negotiations looking to the disposal of the remainder of the 5 per cent. bonds. On Thursday last the bids were opened, but up to this time the Secretary of the Treasury has given no information as to the prices offered, the amount bid for, &c. We have reason to believe, however, that a bid was made by a syndicate which will probably be accepted, for about \$168,000,-000, the amount not taken by other subscribers. The terms of this arrangement, so far as we can learn, are that the syndicate shall take \$55,000,-000 of bonds absolutely, and that they have the option of taking the whole or any part of the remainder within three months after Nov. 1st. the price being par and interest in gold up to Nev. 1st, less 1/4 per cent. discount. Considering the prevailing ease in money and the commanding influence of the bankers composing this syndicate, and that the government has the power to create a market for the new bonds by calling in an equal amount of Five-twenties, it seems impossible to doubt that the option upon \$113,000,000 of the bonds is practically the same thing as a sale; and we may therefore conclude that the entire 5 per cent. loan 18 disposed of. During the week the money market has been

very easy at 2 @ 3 per cent. on call. Prime mercantile paper is fairly quotable at 5 @ 7 per

Gold has been heavy, partially on account of the Treasury negotiations, and partly from other causes. The following shows the daily range of the premium :

													ł	1	1	g	hes	t.			Lo	w	esi	
Thursday				 													110					10	093	á
Friday				×	ú		è				×						109	1/4				910	195	ζ
Saturday			ě.														109					10	193	ć
Monday																						10	193	6
Tuesday.				0	0 1		 	0	۰								109	16				10	99	
Wednesda	a;	y		0		ı,	 	۰,				,					109	%				10	99	

109 is the lowest quotation of gold in this market for many months.

In the stock market the week was been one of unchampled duliness. Few large operators are in town, and no active movements are expected until the end of August. The principal dealings have been in Western Union, Lake Shore, Erie, Rock Island, Union Pacific, Pacific Mail and St. Paul.

Government bonds have been firm. State bonds and railroad morgtages are dull and

The bank statement shows a decrease of \$1,108, 600 in specie, an increase of \$1,861,100 in Tubular Lan'ern, and although put on the man legal tenders, an increase in loans of \$1,146,900, and in deposits of \$1,329,700. The total reserve of the banks, on the averages of the week, is \$6.25 per dozen, net. In large lots a libera amounts to \$90,861,500, against \$89,609,800 last week, and the banks now hold \$29,283,175 lawful money more than the law requires, against \$33,863,100 so held last week. The following is a comparison of the averages of the past two

	July 18.	July 25.	D	ifferences.
Loans	\$935,315,000	\$284,169.100	Dec.	\$1,146,900
Specie	27,755,300	26.646,700	Dec.	1,108,600
Leg. Ten	61,853,700	63,714,800	Inc.	1.861.100
Deposits	942,983,600	244,314,300	luc.	1,329,700
Circ'lation	25,727,500	25,767,600	Inc.	40,100

The following tables show the movements

in foreign trade for the v	veek:	
IMPOB	T8	
1872. Total for week\$8,535,341 Prev. reported214,502,188	1873, \$6,967,706 \$33,178,266	1874. \$8,740,546 230,434,477
Since Jan. 1\$253,037,529 Included in the importatise for the week are:	-	

	guant.	value.
Anvils	90	1.101
Brass goods	14	2,232
Bronzes	25	3,350
Chains and anchors	200	9.015
Copper		6,180
Cutlery	169	62,519
Guna.	93	12,964
Gun barrel molds	97	1,435
Hardware	100	16,568
Iron pla tone	400	
Iron, pig. tons	10.900	5,343
R. R. bars	12,300	269,493
Iron, cotton ties	771	3,C50
Iron, other tons	814	42,748
Lead pigs	.6,894	42,764
Metal goods	278	20,371
Nails	8	1,287
Needles	19	5,108
Platina	3	7,704
Per. caps	10	2,298
Saddlery	9	1,696
Steel	4.093	49,528
Tip, boxes	19,457	158 060
Tm, 4378 slabs	94.780	52,048
Wire	9:19	6,266
Zine4	99 200	10 401
	140,003	18,281

	EXPORTS EXCLUSI	VE OF SPECI	E.
For the w Prev. repo	1879. :ek \$4,974,943 rted120,002,854	1873. \$5,764,323 157,131,573	. 1874. \$6,661,788 163,948,815
ance Jan	1\$124,277,797	\$162,895,896	\$170,605,108
	EXPORTS OF	SPECIE.	

Total for the week... Previously reported

Total since January 1, 1874	96.582,841 $48.786.037$
Bid.	Asked.
U. S. Currency 6s	118
	117%
	110
	113%
	11334
	115
	115%
	115%
	117
	. 115%
	116%
	115%
U. S. 5-20 1867, COIL	117%

The following were prices of stocks to-day	the	highest	and	lowest
U. S. 5-30 1861, COR. U. 5-30 1868, reg. U. 5-30 1868, cou. U. S. 10-40 reg. U. S. 10-40 cou. U. S. 55 1881 reg. U. S. 58 1861 cou.		118	34 36	117% 116% 118% 113 113% 1117%
C. S. 5-20 1867, COIL	***		7.0	1174

. S. 5s 18d1 cou		113	136 1
The following we prizes of stocks to-d	re the	highest	and lov
N. Y. Cen. & Hudson C Like Shore Rock Island New Jersey Central Del., Link, & Western		High- dated100	est. Lou
New Jersey Central Del., Lask. & Western Wallish		105	% %

Western Union Telegraph 78%	72
Northwestern	38
Northwestern Preferred 55%	55
Milwaukee & St. Paul 36%	35
Milwaukee & St. Paul Preferred 54%	54
Pacific Mail 44%	44
Erie 82%	32
Ohio & Mississippi	25
Union Pacific 27%	26
C. C. & Ind. Central 1734	16

GENERAL HARDWARE.

We are pleased to be able to report decided activity in the Hardware market. A good many buyers are in town, and several of our houses are quite busy, although orders seem to to rather light, and evidently for only such goods as are needed. Travelers are sending in satisfactory orders, and the feeling is very

We understand that the Providence Tool Co., who have hitherto been adhering to the former combination rates for Clothes Wringers, have now made up their minds to meet competition. and will sell their Providence and Reliance Wringers as low as similar goods can be bought.

There is a decided improvement in the demand for Foreign Hardware, and a good many buyers are in town. We hear of no changes in values of importance. J. & Riley Carr quote their "Dog" Brand Files and Rasps at \$5:50 to £, gold, formerly \$5.50 for Files and \$5.75 for Horse Rasps. %-inch Coil Chain continues to be quoted at 8% cents, gold, in a small way. The market for Nails 18, if anything, weaker than when we last reported it, although quotations are unchanged. The demand is light, as is usual at this season. We quote 10d, \$3.75 @ \$3.85, according to brand, some makers refusing to fill orders for large or small lots at better than the latter figure. Some brands have been offered during the week, in lots of 500 kegs, at \$3.70, net, for 10d.

The Union Nut Co., No. 78 Beekman street have issued a revised discount sheet, which contains some changes. Their Bow Pins are quoted discount 50 and 10 per cent. from the following new list: Per dozen, \$1.50, \$1.60, \$1.70. Cattle Leaders, new list, \$2.80 and \$3 per dozen, discount 50 and 10 per cent. Nuts, small, 6 cents, and large, 8 cents off list. Washers, small, 8 cents, large 10 cents off list. New Adjustable Plumbs and Levels, discount 60 and 10 per cent.; Non-Adjus able Plumbs and Levels, discount 60, 10 and 10 per cent., and Pocket Levels, discount 50 and 10 per cent. The Wheeler & Clemson Mfg. Co. quote their Hand Saws discount 15 per cent., and Cross Cuts discount 30 per cent. for the ensuing sea-

R. E. Dietz, No. 54 and 56 Fulton street, has added to his line of Lanterns a new Lantern No. 74, to burn kerosene or candles. This Lantern takes the same globe as the well-known ket at a very low figure, is a strong and wel made Lantern. The price to the regular trade discount is allowed.

The Emmet Hammer Co., of Brooklyn, E. D., quote their Hammers at discount 25 per cent., instead of 10 per cent., as formerly.

J. Clark Wilson & Co. have been appointed sole agents in this city for Palmer's patent Door and Gate Springs, which they offer to the trade at the following list, less 10 per cent. discount :

Silver Plated	9.00
D. R. Barton, Rochester, N. Y.,	has issued
the following discount sheet under	
20th inst., which applies to his new	
He says: "I have no connection	
with any similar establishment. Good	
'D. R. Barton & Co.' are not made b	
letters thus addressed will not reach	me."

All good														
Handles	and	l B	enc	h 8	er	ew	8				 	 	 	 20
All good														
Nos. 278	, 27	9, 2	80 1	and	2	81.					 	 		 .10
All good	ds N	08.	28	2 to	0 2	94	in	:lu	si	ve			 	20
Pump T														
Files														
Belting														

ing Goods this week, and we have heard of some fair orders being placed. There are no further changes to report in lists or discounts. William P. Kellogg & Co., Troy, N. Y., have issued the revised list and discounts for their Curry Combs and other goods, which we print below. In their list of Curry Combs we notice the following new patterns, which are worthy the attention of the trade : No. 223, list. \$2.75 and No. 224, list, \$8.50. The latter combines a Mane Comb, so arranged on the back of the Curry Comb as to be easily folded down, out of the way, making a very convenient Comb for the mane and tail. No. 18741, at \$6.38 per doz. is a tinned all iron Curry Comb, extra strong The handle is made of a single piece of wrought iron, shaped to fit the hand, and contains the very useful adjunct, a steel Hoof Pick, which folds on the hardle when not in use. No. 1874. list, \$7 per doz., is the same pattern japanned. This pattern has been adopted by the War De partment for the use of the army of the United

To.	Per doz.	No.	Per d
000	\$0.75	206	23
001		2061/2	8
0136		21)	1
3		220	1
5		2 55 oval	
		2 : f straight fac	
51/2	4.00		
6		199%	
12		9	
14		2524	
15		=:(0	
16	2.60	1468	1
1616		410	
18		420	9
21		425	9
25		430	
81		430	
41		460	
51		465	
E2	1.70		
52	1.00	480	
52%		486	
80	2.90	1020	
115	1.80	1030	
118	2.30	1095	1

States. Mr. F. Wiebusch, No. 84 Chambers

street, is the agent for these goods in this city

CURBY COMB 8.

4	HORSE B	RUSHES.
A SANANA MANANA	Wooden Backs. No. Per doz. 9. Granger \$2 *2b 15. Mod · c 2 *50 25. Stable Boy 3 *26 30. Creus Chief 3 *37 217%, Dexter 3 *25 32. White Holly 3 *87 50. Red Head. 4 *10 40. Home Stretch 4 *37 Farmer John 5 *50 45. White Holy 5 *50 17. Rose Wood 5 *25 23 6 *00	Leather Backs, No. Per doz 200, Red Leather. \$6.00 300, mbossed \$9.00 510, Morioc 10.00 512, Birl 10.00 422, Lady Thorn 12.55 5, Plum Leather. 14.00 503, Russet. 17.00 10, Plum Leather. 20.00

WHITEWASH HEADS. The following lines of Whitewash Heads, com-rising three grades of Brushes, are of sufficient va-

				"B" C	quality.			
No.	6.	Widt					er do:	84.50
No.	636.						4.6	5.20
No.	7.	8.0	7				6.6	6.5
No.		6.6	734	in			6.6	8:00
No.	8,	66	B				6.6	10.00
No.		6.6	812	in			6.0	12.00
No.	9.	64	9				6.6	14.00
No.		64	914	in			+6	17.50
	1036		1014	in			66	90.00
	20784		20/8	*******	Dis	count	50 per	
A 11	Brist	loe	66	WIII On				ily Une.
No.		Widt	h 7					
							SOD 334	z., \$8.50
NO.	7%,	9.5	6.79	III			45	9.50
No.	8,		8				66	11:00
NO.	836	44	859				45	12.50
No.			9				6.5	14.00
No.			936					17:50
No.	10,	64	10	in			46	25.00
					Dis	count	50 per	cent.
	- CIT-	ze. A		stles.	Owalite		Mason	ns' Use.
Lar,	ge Si		0.0	AA	CHESTIE	V .		
Lar,				XX "			er doz.	. \$24.00
No.	7, V	Vidth	7 in			pe	er doz.	\$24.00 84.00
	7, V	Vidth	7 in 8 in.			pe	er doz.	\$24.00 84.00 44.00

						1	F	1	17	r	Ħ	E	R		CARDS.			
Curry		۰												,	Discount	pa	irs,	\$1.75
MULBO.	۰		0.		٠				0	0					Discount	35	per	cent.

SCALES.
Premium-With Weights.
No. 1 Tea. Steel B'gs. 1ron B'gs. No. 2 Grocer. \$260 2:20 No. 3 \$260 3:00 No. 4 \$425 3:75 Discount 10 per cent.
Union Platform.
No. 1, Steel Bagsper doz., \$75.00 No. 2, Iron Bags
Counter Grocer.
No 1each, \$8:80

No. 2 6·44
Discount 10 per cent.
We have added the following Scales to our assort-
ment, and will guarantee them equal, in all respects.
to anything in the market. The bearings are all
made of bardened steel, and the workmanship is un-
surpassed.
W. P. K. & Co. Union Platform.

% oz. to 240 lbs., Tin Sco Brass "	Discount 5 per cent.
BORING 1	CACHINES.
Upright. Each. Trojan	Angle No. 1, Patented. Each Trojan. \$3.0 Keilogg. 6.7 Sweet. 6.2
Augers. (Not subject to discount). Per set. W. P. K. & Co \$ net	Angle No. 2, Regular. Each Trojan
Cast Steel	Discount 15 per cent.

	MORTISING 1	TACHINES.
No. 1, No. 2,	Complete	Discount 10 per cent
Extra	Chisels % to 9-16 in.	Discount 10 per centeach, \$0.75 net

									ACKS.
No. 1	, Japanne	ed					 	 	per doz., \$25.00
No. 1	36. "			 		 	 		
No. 2	2. 06	de					 		4.00
No. 8	L 65			 		 	 		14 2:2
No. 4	. 46							 	per gross, 18:00
No. 4	Nickel I	Plate	d						36.0

BRITISH IRON MARKET.

(Specially reported by cable for The Iron Age.) WEDNESDAY, July 29, 1874.

Scotch Pig.-Immediately after our last cable report was dispatched prices went up, and have since been steadily firm, the market being strong, with a large business doing.

Following are makers prices:
Coltness No. 1
Gartsherrie No. 1
Glengarnock No. 1
Eglinton No. 1

Manufactured Iron .- The market is quiet improving, and a fair amount of business doing. Prices are steady at £10. 10 @ £12 for Best Staffordshire Bars.

Rails.-There is an improving demand for Rails, and a fair amount of business has been 21%c.; L. and F., 21c.; and Banca, 25%c., all done. Prices are steady. We quote Welsh unchanged at £7. 10 @ £8. 5/.

IRON.

American Pig .- We are unable to report any improvement in demand or advance in prices in this market, although we have such reports from many other quarters. The disposition of consumers continues to be to buy no nore than their present wants require, and speculators show no disposition to operate at any price or on any terms. A correspondent in the Lebigh Valley writes us that Pig Iron is moving from the Lehigh Valley more actively than for some months past. There continues to be a scarcity of Gray Forge. We cannot learn of any considerable sales, and we quote as last week : Foundry No. 1, \$31 @ \$32.50 ; Foundry No. 2, \$29 @ \$30; Gray Forge, \$27 @ \$28.

Scotch Pig.-The reported advances of the other side have at last operated to strengthen the market, and in several cases holders are higher in their views. Stocks are being reduced, and are now in small compass. We quote: Coltness, \$40; Carnbroe, \$34 @ \$34.50; Eglinton, \$33 @ \$33.50. Summerlee and Gartsherrie are not in stock.

Bar .- The inquiry for Bars continues to be

pound, we hear of no large orders having been placed. By the time that consumers have con cluded to pay the advance, it is more than the article drops to 5%c., gold. We may menprobable that Bars will have advanced to 3 3 10c., tion, as a piece of general information, that the as the mills now generally seem determined to carry the selling price to a point that will cover cost of production. The majority of mili owners East place present cost at about 3 3-10c. laid high for many smaller smelting establishments, few prominent mill owners claim it to be as get it resmelted and refined for their account, high as 3 5-10c., these prices, of course, being for best Refined Bars, from boiled Muck Bar. A oner article could be produced at much

Rails.-We hear of the sale of 2000 tons American on private terms, and further sales of Welsh at \$47, gold. We quote American, \$57 @ \$58, at works, and Welsh \$47 @ \$50,

Old Rails.-The supply of Old Rails con tinues far in advance of the demand. We note sales by a mill of 7000 tons at a price which will make them about equal to \$36 delivered at mills in Pennsylvania. They were sold principally to Bar mills. We quote \$35 for Ts.

Scrap. - We note no transactions of im portance. We understand there are about 4000 tons now pressing on the market, which have been held by the importers for over a year We quote Wrought Scrap, from yard, \$36

METALS.

Copper.-The market has been quiet and with a downward tendency, 150,000 pounds Lake selling at 221/4c. Futures can be ever more than one broker is employed. Nor bought at 22c, for September. Seldom has a transaction called such general attention as the great Copper speculation during the spring. It had been conceived with great boldness upon the heels of a panic, with its inevitable industrial prostration. Money, as is usually the case after a crisis, was easy, but the consumptive capacities of the country at large had been checked, and even impaired. It was extremely doubtful, therefore, whether, with the dull summer season before us, the said speculation would be assisted by much of a demand. Although it is granted on all hands that consumer hold but light stocks, they nevertheless show little willingness to purchase beyond their more immediate requirements, and the consequence is, and has been till now, that the sales have not been large enough to lend any sound support to prices. As outside supplies were constantly in Foreign, nominally worth 61/4c. @ 63/4c., being furnished by the small companies, the light demand was thus sufficiently met from these minor sources, which the speculative holders had not taken into consideration. The Copper which these small companies sell cannot be produced by them at the price which they of it. obtain for it, and should the market break down still further, they will soon be compelled to stop producing altogether, and the value of the metal will then have reached its proper level, from which, under a brisker consumptive inquiry, it may vigorously react. In other words, appearances lead to the inference that we shall go still lower, and may then, with the least revival in the consumptive demand, be in a condition to experience a healthy rebound. The moment speculation gets to be mixed up with a metal on a vast scale, it is apt to become extremely sensitive in this telegraphic age. We witness this daily with respect to Tin in Europe. Copper has now been handed over once more to these mercurial influences, and the shipmen made from here to Europe, on becoming known on the other side, had its depressing influence but upon second thought there was a slight im provement soon after. But, according to a letter from London, dated July 18, the bungling manner in which Copper was being offered by cable from all quarters from this side had a worse effect than the announcement of what was actually bought for Europe, and they got fairly shipping point, and send them, by way of relief to ourselves, a couple of thousand tons of Lake Copper more. Manufactures are well sup ported, as follows: New Sheathing, 33c.; Bolts and Braziers, 85c.; Bronze and Yellow Metal Sheathing, 24c.; and Yellow Metal Bolts, 30c.

net cash. Tin Or jobbing demand, while to arrive nothing has been done. We quote Straits, 22%c., gold, on the spot, and 221/4c. to arrive; English Refined. gold. As regards the foreign market, we hourly expect the cable dispatch announcing the result of the Dutch sale. Under date 18th instant we have the following from-London: "A rather serious fall has taken place in foreign, and this, of course, has affected the position of English; in fact, there is a drop employes is ended at present, and as everything in value all round, and up to the present time it is quiet, no further trouble is anticipated. does not appear to have produced the desired effect of stimulating the consumption. There is no disposition apparently on the part of anybody to buy, and until the holidays are over there will probably be little doing." Straits was at the time £96 @ £97; the Dutch sale will work. The receipts of Cumberland Coal were determine its value for some weeks to come. Meanwhile it had recovered, as per cable, to 298. Tin Plates,-The tendency of the market Yougheogheny Gas Coal Company has limited at New York is a downward one, and while we repeat our quotations of a week ago, we may add that an eighth of a doller off will probably purchase any one of the descriptions: I. C. Charcoal, \$10.25 @ \$10.37%, gold, per box; gold. Nothing has been done in Tin Plates to arrive.

Lead .- The market is at a complete standlively. Owing, however, to the advance made surance that the government will not seil for \$7 @ \$9. 160 1874, army tinned. 6738
by Philadelphia and other prominent Eastern Discount 39 per cent.

Pennsylvania mills last week to 3 cents per 5%c, gold, for domestic, nominally. The mo
Branch Railroad during the week ending July

ment we have the firm announcement that the government will sell in ten days, for instance, roads have been very bad out West, and that from this circumstance a scarcity of "base bullion" has arisen, which sells at figures too down in New York or Philadelphia, while a and has also been forwarded by the miners that in comparatively limited quantities. The light stocks are thus accounted for in part; but we should guard against jumping at the conclusion that this falling off will counteract the depress ing effect of the government sales in prospect. The country produces Lead enough, and it will all be put on the market in due course, as so as we can put it in shape. Foreign Lead we quote 61/2c., gold, with little or nothing doing. Mr. Emile Herold received per cable yesterday the following cost, insurance and freight offers from London, shipment per steam, 90 days' credit: "Common English Pig Lead, £21. 17/6; Selected Refined ditto, £23. 10/." Manufactures quiet. We quote: Bar, 81/c.; Pipe and Sheet, 9c., with 20 per cent. discount; and Tin Lined Lead Pipe, 161/2c., less 10 per cent.

Spelter and Zinc .- Domestic, strange to say, is now down to 6%c., currency. The Spel-ter companies at the West would perhaps find it in their interest to reconsider the policy hitherto pursued of shipping their produce to the dealers on this coast. Competing dealers will not buy of them, but do so through brokers, causing the article to be offered a great deal more than is desirable on a quiet market, whenare some of the dealers fully posted about the European bearings of the article absolutely necessary for a correct judgment. The present instance is a case in point. Not one article. Lead perhaps excepted, stands so well secured in its more immediate future in Europe as does Spelter, and yet, while the commonest kind of Spelter could not be laid down here for less than 6%c., gold, or 71/8c., currency, the Western Spelter companies foolishly throw away money by allowing their product to sell here at 6%c., currency. The proper course to pursue would seem to be to select responsible and experienced parties in our midst not in competition with the dealers. A great future awaits the West in Spelter; let this business then be placed on a basis to insure the West the largest returns. Nothing is doing gold, according to brand. While Silesian Sheet Zinc costs from 81/6c. to 81/4c., gold, to import, it is all along sold at 8c., gold, and this course also keeps down the domestic article, and is discouraging to the manufacturer

Antimony.-We are in fair supply, and with a light demand. The price remains 11%c. @ 11%c., gold.

COAL.

We have still no improvement to note in the pudition of the Coal market. The demand for Anthracite has been very poor, and dealers are still complaining of small orders and general dullness. The usual monthly sale of Scranton Coal was held to-day (Wednesday) at the auction rooms of the Company, No. 26 Exchange Place. The amount offered was the same as last nonth, being 25,000 tons. The attendance was large and the bidding was spirited. The subjoined table shows the difference between the prices obtained at this sale and that of June :

	Tons.	July.	June.	
Steamboat	5,000	\$5.00	\$4.87% @ 4	90
Grate	5,000	5:00	5.00 @	-
Egg	5,000	5-27%	5.13% @ 5	15
Stove	5,000	5.77%	5.62 60 .	
Chestnut	5,000	4.72%	4.57% @ 4	62%
The fellowi	-	the prices	observed for C	cala

mined by the Philadelphia & Reading Coal and Iron Company, deliverable on board vessels at frightened. Their apprehension, probably, was Port Richmond, Philadelphia, for the month of that we should outright decline here to the August. The Company reserve the right to withdraw or change these figures at any time during the month except on sales made prior to such changes :

		Lump.		Steamer.		Broken.		Egg.		Stove.		Chestnut,
Hard White Ash Coal	4	8 60	4	\$	4	8 80	4	8 56	5	\$ 45	4	\$ 00
Free Burning White Ash Coal				70			п		1		1	
Schuylkill Red Ash Coal.					4	95	5	06	5	50	4	25
Alaska Red Ash Coal												
Shamokin Coal												
North Franklin Coal					5	40	5	40	5	45	4	2
Lorberry Coal					5	75	6	75	5	75	4	33
Lykens Valley Coal							6	40	6	40	4	95

The trade in Bituminous Coal still continues very dull, and prices are unchanged. The strike of the Cumberland and Pennsylvania Railroad Speaking of the Cumberland Coal trade, the Washington Chronicle says: "The Coal trade for the week ending Saturday last was limited by interruption to canal navigation, but, notwithstanding, was about an average week's 18,074 tons, and the shipments of the same 17,176 tons. The strike at the mines of the the supply of that Coal, and there were only 1690 tons of the same shipped, making the total receipts of Coal for the week 19,764 tons, and the shipments 18,851 tons."

We quote as follows: Anthracite, \$5.25 @ I. C. Coke, \$8 @ \$8-25; Coke Terne, \$7 @ \$6-10 per ton, by the cargo; Cumberland, soft, 1. C. Coke, \$5 @ \$5 37; Coke \$1.50; Pennsylvania \$7:50; and Charcoal Terne, \$9 @ \$9.25, all \$7; West Virginia, \$7.25 @ \$7.50; Pennsylvania and Westmoreland, \$7.50 @ \$8; American Cannel, \$12 @ \$14,

The demand for Foreign is limited, and prices still, owing to the uncertainties which surround remain as last reported. The quotations are: the management of the government Lead sales; Liverpool House Cannel, \$18 @ \$19; Liverpool nobody wants to buy except under some as- Gas, \$11; Newcastle Gas, \$7.50 @ \$8; Scotch,

The Coal transported over the Cumberland

25, 1874, amounted to 6987 tons, as against 6156 and at better terms of payment as a rule. This tons shipped in the corresponding period of demand, if it may be so termed, is reflected in last year, showing an increase of 831 tons. Over the Old Rail market as to transactions, but not the Cumberland and Pennsylvania Railroad, for as to rates. Scrap continues abundant, and mag the same period, the shipments were 51,047 be quoted fairly active. The conditions of the tons, against 57,037 tons shipped in 1873, a denext formight will probably indicate the crease of 5990 tons.

The leading Coal carrying companies make the following reports of their tonnage for the week, and for the Coal year to the same date, 2, \$29 to \$30; Gray Forge, Schuylkill and Lecompared with their respective amounts carried to the same time last year :

The total of Anthracite marketed for the week ending on the 18th instant amounted to Ralls, 2300 tons T's, U's and D.H's at prices 254,699 tons, and for the Coal year 9,865,528 tons, against 10,232,571 tons to corresponding time last year, being a decrease of 367,043 tons. The Bituminous tonnage for the week is 64,274 tons, and for the year 1,694,330 tons, against 1,650, 605 tons to same time last year, giving a total of all kinds for the week of 318,964 tons, and for the year of 11,559,858 tons, against 11,883,096 tons to the same time last year, being a decrease of 323,318 tons. At Port Richmond for the week ending the 25th instant, the receipts of Coal were 40,000 tons, the shipments 38,000 tons, leaving 73,000 tons on hand. Freights are now quoted at \$1.25 to Providence, \$1.50 to Boston, and 95 cents to New York. The Coal and Coke tonuage of the Pennsylvania Railroad

Hardware.	Lang W. Bailey & Co. Rails, 2441
Barton, Alexander & Waller,	Fish plates, bdls., 978 Naylor & Co.
Wire, cks., 4	Fish plates, bdls., 373
Boker Hermann & Co.	Bars, 387 Randolph L. V.
Packages, 5	Rails, 354
Beam & Murray,	Rubera & Co.
Anvils, 100	Scrap, tons, 95
Degraw, Aymar & Co.	Order.
Chains, 10	Pig, tons, 200
Field A. & Co.	Sheet, bdls., 367
Mdse. pkgs., 40	Bundles, 454
Anvile, 40	Scroll iron, bdls., 140
Fuller Bros.	Bar, bdls., 82
Chains, cks., 100 Files, cks., 11	Tons, 11236
Edge tools, cks., 7	
Cutlery, cks., 9	Bteel.
Carry combs, cks., 11	Naylor & Co.
Mdse. pkgs., 18	Bessemer rails, 1663
Lan & Gartichs,	Cast, tires, 88
Packages, 4	Sheet, cs., 20
Lamarche H.	Prosser Thos. & Son,
Arms, cs., 14	Mdse, pkgs., 114
Mason John W. & Co.	Tire forgings, 272
Wire rope, coils, 4	Order. Bundles, 953
Schoverling & Daly,	Bessemer rails, 132
Mdse. pkgs., 1	Casks, 4
Wiebusch F.	Bars, 16
Chains, 10; cks., 29	assettly at
Windmuller L. & Roelker	Metals.
Arms, cs., 25	Bertschmann J.
Ward A.	Tin, slabs, 2594
Mdse. pkgs., 3	Bruce & Cook,
Order.	Tin plates, bxs., 600
Cases, 12	Naylor & Co.
Files, cks., 19	Tin plates, bxs., 304
	Phelps, Dodge & Co.
Iron.	Tin plates, bxs., 1767
Handanan Dana	Order.

the most reliable advices from the West indi-Manufactured Irons. Bars show some improve.

Schap Iron and Steel.—There is a fair dement both in orders and the sensible determination of the millmen not to shade prices below three cents for good Irons, unless on very large orders, none of which are as yet to hand. In Rails there is a more healthy general to the control of the millmen not to shade prices below three cents for good Irons, unless on very large orders, none of which are as yet to hand. In Rails there is a more healthy general to the control of the millmen not to shade prices below three cents for good Irons, unless on very large with Pig. Following are current buying lates, Rails there is a more healthy general tone, with No. 1 Car Springs....

course of the market for the coming fall. Prices

may be fairly quoted as follows:
PIG IRON.—No. 1 Foundry, \$80 to \$32; No. high, here, \$26 to \$28. White and Mottled, here, \$25 to \$26.

BARS.-3c. per lb. RAILS.-American, at works, as to make and ection, \$59 to \$64.

OLD RAILS, -\$36 to \$38. SCRAP.-\$35 to \$36, for No. 1 Wrought.

The sales include in addition to the usual weekly Foundry lots for immediate consumption 1000 tons No. 1 Lehigh, \$32; 1000 tons do., \$30; No. 2, 1500 tons at \$28 to \$29, here; Gray Forge, 800 tons, spot, at \$27; Rails, 5600 tons 56's varying from \$59 to \$64, at works. Old equal to \$36. Scrap, 300 tons, \$35, for choice selections. The market closes quiet, but firm, at these prices.

PITTSBURGH.

PITTSBURGH.

PITTSBURGH, July 27, 1874.

Business in manufacturing circles, while it cannot be termed active, is about all that can reasonably be expected at this season of the year. Some of our large manufacturing establishments are now stopped, temporarily, taking stock and making repairs, and others will do likewise within the next few weeks. The general outlook is regarded as being favorable for an active and healthy fall trade, and with good crops assured, money matters easy, confidence rapidly being restored, and, what is equally as important, stocks of manufactured goods, both in first and second hands, are known to be comparatively light, as both jobbers and consumers have been buying very sparingly all this year,

	gill for pront, it ony.
ĺ	QUOTATIONS.
	No. 1 Foundry\$29 00 @ 30 00-4 mos.
	No. 2 Foundry 27'00 @ 28'00-4 mos.
	Gray Forge 26:00 @ 27:00-4 mos.
	White and Mottled
	Hot Blast Charcoai 30.00 @ 35 00-4 mos.
	Cold Blast Charcoal 45'00 @ 50'00-4 mos.
	Blooms, as per quanty 80.00 @ 90.00—4 mos.
	SALES REPORTED.—Connellsville Coke: 200
ı	tons Gray Forge, \$27, 4 mos.; 150 do., \$26,
	cash; 100 extra do., \$27 50, 4 mos.; 10 do. No.
	2 Foundry, \$28, 4 mos. Hanging Rock Char-
	coal: 10 tons Mill at \$31, 4 mos.; 12 do. No. 2
	Foundry, \$83.75, cash; 23 do. No. 1 Foundry,

Some manufacturers contend that they are lower than there is any necessity for, and an

No. 1	Wrou	gh	t	T	't	lî	ï	ıi	n	II.	8	41		,	*			×		*	4	6 ,			8	ú	×			i
Car A	xies,	91α			٠	ú	٥			0	0	0					٠	0	0	0	0 1					0	0	٠		
Light	Iron						0				۰			0		9	ė	n	٠	0	0 1				0	v				
Stove	Plate						0								,	0		۰									٥	٠		
Machi	nerv	Me	ti	al	١.															0	0						۰			
Boiler	Plate	e.																												
																							ï	١,	21	ė.	ø	T	o	a.

occurred at a more opportune time, so are as the ore companies are concerned.

The Pittsburgh Commercial of July 25, says: We cannot report so many tons of Iron sold this week as last, nor any noticeable change in prices, but the firmer feeling referred to last week still continues, and we hear of several parties who were then willing to sell at market rates, who have taken their Iron off the market for the present. We learn that a large number of miners in the Lake Superior Ore region have stopped work, and that it is thought quite probable that the strike will become general and continue a long time, and it is quite likely that this may have had some influence in inducing parties to withdraw their Iron from the market. The receipts of Pig Iron by rail from the valleys have been very large the past two or three weeks, but the shipments are mostly on orders placed two or three weeks ago. We are reported the following sales:

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR

300 tons gray lorge	
300 tons gray forge 27:00-4 mos.	1
300 tons gray torge 27:00-4 mos.	1
150 tons gray forge 27.00-4 mos.	П
100 tons gray forge 26°75—4 mos.	i
100 tous gray forge	ű
100 tons amor force 97.95 4 mos :	ď
100 tons gray forge 26.50-4 mos. 1	1
100 tons white and mottled 25'00-4 mos.	1
70 tons, a mixed lot 24.00-5 mos.	1
60 tons No. 1 foundry 29 00—cash.	1
50 tons No. 1 foundry 30°00-4 mos.	ľ
40 tons silvery	
40 tons No. 1 foundry 29.00-4 mos.	3
20 tons No. 2 foundry	á
10 tons No. 1 foundry 29.00—cash.	i
	í
CONNELLEVILLE COKE.	í
200 tons gray forge \$27.00—4 mos.	1
150 tons gray forge	
100 tons gray forge, extra 27.50—4 mos.	3
10 tons No. 2 foundry	3
HANGING BOCK CHARCOAL.	1
23 tons No. 1 foundry \$36.00 @ \$39.00-4 mos.	3
12 tons No. 2 foundry	١
10 tons mill iron 81 00—4 mos.	
to tone min non ar oo-4 mos.	4

Coal were 8,000 cam, to a contract of 100 cam and a contract of 100 ca

HOT BLAST CHARCOAL.
Hanging Rock No. 1. # ton. \$34'00 @ 35'00—4 mos. No. 2
Forge
Alabama No. 1
HOT BLAST STONE COAL.
Missouri No. 1 \$2 ton \$32.00 @ 33.00—4 mos.
Ohio No. 1

COLD BLAST CHARCOAL. | Cold Blast Charcoal | Hanging Rock Car Wheel Per net ton. Alabam \$5 '00 Machine 30'00 Blooms

BALTIMORE.

Messrs. Wyeth & Brother, Iron and Steel merchants, South Charles and Lombard streets, report us the following prices under date of July 28: During the interval since our last report we note an improving market, and we quote the same as firmer, but with unchanged list.

n			
n	AMERICAN REFINED BAR IRON.		
i,	1 to 6 wide by ½ to 1 thick. \$ 9 to 8.1 cts.	per	D.
v	Round and square, ordinary sizes, from		14
OP.	% to 2 inclusive 2 9-10 to 3 1-10c.		6
g	Hoop Iron, 1% wide and upward 4% to Sc.		
),	Band Iron, from 1% to 4 in. wide. 4 to 4%c.	*	
е	Horse Shoe Iron % to 1 wide by % to %		
8	thick 4½ to 5c.	6	
h	Norway Nail Rods 7% to 8%c.	- 4	6
u	Black Diamond Cast Steel, Flats, Squares		
f	and Octagon, ordinary sizes16%c.	6	
e	Machinery Steel	01	
e	Machinery Steel	61	
	Cast Spring Steel	8.5	
	Homogeneous Steel Plate 13c.	A W . C	
	Perkins Horse Shoes, per keg of 100 lbs	\$0.0	16.76
á	Mule Shoes "	0.8	17%
1	Common Horse Nails, from 14c. to 18c, per pou	nd.	
a	10 9 8 7 6		
t l	Putnam Horse Nails. 23 24 25 26 28c.	per	R.
1	10 9 8 7 6		
1	Globe Horse Nails23 24 25 26 28c.	per	Th.
	R. R. Spikes 5% by 9-16 at 3%c to 4c.		
t	The It. Spines	Beer	
r	And the same of th		
e	CLEVELIND		

CLEVELAND.

Messrs. READ & DICKEY, Iron Brokers, under date of July 27, write us as follows:
Pig Iron.—The market remains substantially that this may have had some influence in inducing parties to withdraw their Iron from the market. The receipts of Pig Iron by rail from the waileys have been very large the past two or three weeks, but the shipments are mostly on orders placed two or three weeks ago. We are reported the following sales:

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR ORE.

300 tons gray forge.

300 tons gray forge.

300 tons gray forge.

27:00—4 mos.
300 tons gray forge.

27:00—4 mos.
100 tons gray forge.

27:00—4 mos.
100 tons gray forge.

27:00—4 mos.
100 tons gray forge.

26:50—4 mos.
100 tons white and mostled.

25:00—4 mos.
100 tons No. 1 foundry.

29:00—cash.
200 tons Ray forge.

26:50—4 mos.
100 tons No. 1 foundry.

29:00—cash.
200 tons Ray forge.

26:50—4 mos.
100 tons No. 1 foundry.

29:00—cash.
200 tons Ray forge.

26:50—4 mos.
100 tons Ray forge.

26:50—4 mos.
100 tons No. 1 foundry.

29:00—cash.
200 tons Ray forge.

26:50—4 mos.
100 tons Ray forge.

26:50—4 mos.
100 tons No. 1 foundry.

29:00—cash.
200 tons Ray forge.

26:50—4 mos.
100 tons Ray forge.

27:50—4 mos.
100 tons Ray forge.

28:50

	THE STATE OF THE S	
	CHARCOAL PIG IRON FROM L. 8	ORE.
Nos.	1 and 2 Foundry	\$40.00-4 m.
Nos.	8 and 4 Car Wheel	42.00—4 m.
Nos.	5 and 6	45 00-4 m.
Вевы	emer Metal, Charcoalemer Metal, Bituminous	30 00—4 m.
	BITUMINOUS PIG IRON FROM L.	S. OBE.
	Foundry	
No. 1	Gray Forge Red Short	28'00-4 m.
No. 1	Gray Forge Neutral	27.00-4 m.
Whit	e and Mottled	
	PIG IRON FROM BLACK BAND	
Mass	illon No. 1	. \$98.00-4 m.
Maga	illon No. 9	31'00-4 m.

															da	
Bar, Band and Hoop	L	1	21	n.			 			 					. 2	-7
Sheet Iron, No. 24										 					. 4	1.6
Nails, 10d. to 60d																
Ship Spikes, 36 and	la	r;	Z)	er			 	۰			۰	۰			.84	2

BEIGIUM.

delayed to the present time for purely financial reasons. Coal, the excessively high range of which had mainly con ributed to bring about the late industrial crisis, has now declined to prices so low that all impediments to a revival of Iron industry have been removed. Yet, with all these elements of prosperity surrounding us, we perceive but a slow awakening from a long stagnation. Thus a good many blast furnaces bave nor yet rekindled their fires; Iron the resumed operations. In France, Wrought Iron has improved 2 tranes the 100 kilos, while Pig Iron there has been following the upward tendency but slowly, in the Lorre region, for instance, but 136 francs per ton. In Belgium, orders for future delivery are as yet quite scarce, while commands of a pressing nature are more frequent, Inquiries are plentiful. Russia has appeared in the Belgian markets with extensive orders, both of Sheet Iron and Rails, more especially at Liege and Charlerol. All these Russian commands are for immediate delivery. Common Coal for domestic use ranges between 18 ar d 22 francs. Coke is 22; washed do., 30. Metals are quiet, but Spetter cannot be had below 55 francs, while Lead is obts in ble at 22. Copper is firm at 2.15. Tin is presently offered at 2.55 francs.

GERMANY.

GERMANY.

(Borsenhalle.)

HAMBURG. July 14, 1874.—Copper.—Not much change can be reported as having taken place in the Gorman markets; they are, on the whole, quet and firm. Stocks here are very pearly exhausted and firm has sold at 90 marks. Good quality English that we are rather quiet with this metal in Germany, but have, nevertheless, had rates sustained at all points. Lead has been in good demand without leading to any further improvement. Although Spelter has been less active, the same firmsess hitherto reported has been upheld. No sales can be advised from here. Good brands Silesian are 7% to 7% thalers, at Berlin. Silesian Union, at Breslau, is 6% thalers.

(Koch & Viterboo ROTTERDAM, July 14, 1874.—The.—The market in remarkably quiet; small parcels of Banca on the spot have gone at 57½ culiders; from the July sale at 57; september, ditto, at 58½, and Billiton, epot, at 56. The Dutch Trading Society will sell at Amsterdam on the 39th inst. 32,100 slabs, Banca.

	SALES OF THE SOCIETY—BANCA TI	
	Slabs.	Guilders
ľ	1854, August 9	66,-
	1855, August 16	74,50
	1856, August 7167,382	73,50
	1857, July 16	82,25
١	1858, July 6 190,842	68,20
	1859, July 7	89,50
	1860, June 28	79,50
	1861, June 26	69
	1862, June 25	67,75
	1863, June 24	76,
	1864, June 29	61,75
	1865, June 29	56,
	1566 March 29	49,86
	1800 Sept. 28	46,
	1867 March 28 69,477	54
	/ Sept. 20	54,95
	March 31 10,600	55
	1868 June 18 2,500	55,05
	(Sept. 30 89,587	64.50
	1869 April 1	82.50
	Oct. 1 61.683	74
	1870 March 31	72.50
	1 Oct. 7 80.004	75,30
	1871 March 30 80,971	\$5,-
	Sept. 28 88.217	78,30
	1872 April 11 59,772	96-98%
1	Oct. 2 46,512	92-921/
1	(April 2 75,168	87-84
ı	1873 Sept. 25 30,055	75,05
1	Nov. 27 29,993	67,45
1	Jan. 29 20,825	70,50
1	1874 March 25 19,861	06.35
1	May 29 28,328	\$7,50
1	July 29 22,100	****
1		

COURSE OF PRICES SINCE THE AMERICAN WAR-BANCA TIN.

1865 1806 1867 1808 1869 1870 1871 1872 1878 1874

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

> (From our Regular Correspondent.) SHEFFIELD, Eng., July 13, 1874.

The quarterly meetings, Cleveland, have been held during the week at Middlesboro,' Wolver-hampton and Birmingham, with results which cannot by the most sanguine person be pronounced to be of a very satisfactory nature, or of any real us; to the iron trade generally. At the Middlesboro, meeting, which was the first held, the attendance was very limited, and there was very little departure from the rates for pig iron or finished iron which have prevailed for several weeks past. Quotations for pig iron were generally at-No. 1, 67/6 to 70/; No. 3, 61/6 to 62/6; No. 4 forge, 55/ to 57/6, net cash. Finished iron rates in the district named are as under: Angle and bulb iron, £10 to £11; boiler plates, £12 to £13. 5/; cable iron, £11. 10/ to £12; nail rods, £9. 10/ to £10; rivet iron, £11 to £11. 5/; ship plates, £10 to £10.11/; common bars, £9.10/to £10.5/; best bars, £16 to £10. 15/; best best bars, £11 to £11. 15/; puddled bars, £6. 5/ to £6. 10/; hoops, nil; rails, £8. 15/ to £9; and single sheets, £13 to £14. Mr. Jennings showed several samples of foreign ores, mainly Algerian and Spanish, for fettling. The Algerian ore contained about 50 per cent. of iron, and the Spanish 45 per cent. Both descriptions are aiready being used by many firms in the North of England with much success.

THE WOLVERHAMPTON (STAFFORDSHIRE) MEETING

This meeting was well attended, but in a very material degree was characterized by a pro crastinating indecision—the very natural result of the hazey state of prices. It had been hoped by most of those present that the strike of Staffordshire miners would have been brought to a termination as satisfactory as that of the 5000 Cannock Chase men (who have resumed work on a compromise), but this hope, however confidently entertained by many sound business men, was doomed to disappointment hence a drop in prices appeared a matter of hence a drop in prices appeared a matter of great uncertainty and improbability. At the same time it was known and pretty generally expressed that the strike was gradually dying out by the acceptance of the masters' terms, but the satisfaction which might otherwise have been felt at these secessions from those on strike was greatly mitigated by the full knowledge of the undoubted fact that another drop must en ue before either masters or men are i gain in full employment. The strike has since been disposed of. Thus at the close of the market very few transactions of moment had 4 mos.

BRUSSELS, July 15, 1874.— From.—There has been on particular change during the week; it should be remarked, however, that there is now more hopefulness expressed in trade circles, the more so as it is 4 mos.

5 mos.

5 mos.

6 mos.

6 mos.

6 mos.

6 mos.

6 mos.

6 mos.

7 mos.

8 mos.

9 mos.

9 mos.

1 mos

Dank the ce the

prists sciking to to the total that the trial had giving the boro

been effected, many of the negotiations partly entered into being held over until the day after, so that the course taken at the Birmingham meeting might be ascertained. Thus at

meeting might be ascertained. Thus at THE BIRMINGHAM "MEETING," which may be taken to represent South Staffordshire, Worcestershire, Shropshire, part of Derbyshire and Warwickshire, there was a very great attendance and much excitement, until a final declaration was put forward by the two principal producers—Messrs. Barrows and Earl Dudley. When it became known that in both these cases prices had been put down £2 per ton—making the quotations for bars £12, and £12. 12:6 respectively—and that a great pig fron firm (the Lideshall Company) had lowered their prices 10/ to 15/ per ton. The merchants present were much exercised as to the probability of other firms following suit. No further drop was officially announced prior to the close of the meeting; but it was considered so hopeful a sign that what may be termed a moderately good business was done. It was announced that the accountants having finished their examination of the masters' books declared the puddlers to be entitled to 11/9 per ton up to October 3d, and millmen in proportion. This was also regarded as some slight improvement, and as a step in the right direction may afford a little—certainly but a trifling—relief to the iron masters. Current prices for finished iron in the Birmingham and South Staffordshire districts are now, therefore, the following: Bars, common, £12. 10/to £13; hoops, best, £13 to £13. 10/; and sheets, £13 to £16, according to gauge. THE BIRMINGHAM " MEETING, "

THE SCOTCH IRON TRADE continues very quiet, and little bona fide business is being done; prices have come down a shilling or two lower, bringing quotations to figures which are 20/ to 23/ beneath those of a fortnight ago. Warrante have not been largely shilling or two lower, bringing quotations to figures which are 20/ to 28/ beneath those of a fortnight ago. Warrants have not been largely dealt in, and are currently quoted 77/ to 75/. Makers prices are about the following: Gartsherrie No. 1, 100/; No. 3, 82/; Coltness, No. 1, 103/6; Summerlee, No. 1, 85/; No. 3, 80; Langloan, No. 1, 102/6; No. 3, 83/; Govan, No. 1, 83/; No. 3, 80/; Calder, No. 1, 102/6; No. 3, 83/; Govan, No. 1, 83/; No. 3, 80/; Cluder, No. 1, 102/6; No. 3, 83/; Govan, No. 1, 83/6; No. 1, 86/; Olyde, No. 1, 83/6; No. 3, 80/; Clyde, No. 1, 83/6; Glengarnock, No. 1, 90/; No. 3, 76/; Glengarnock, No. 1, 90/; No. 3, 76/; Glengarnock, No. 1, 90/; No. 3, 81; Carron, No. 1, 82/6; Kinnall, No. 1, 85/; No. 3, 82/2 Messrs, Colvin & Co.'s weekly Glasgow circular says: "On Monday a transaction took place at 76/6, and to-day 77/6 is the neminal price. The amount of speculative business being done is exceedingly limited. The general demand countinues quiet; but as the makers are very bare of stock, some fron is again going out of store. We quote No. 1 G. M. B., 80/7 No. 3, 78/; No. 1, Special Brand, 90/to 102/6."

The shipbuilders are fairly well engaged on laterate but there is a second store.

to 102/6."
The shipbuilders are fairly well engaged on old orders, but there is no material influx of new commissions, and its quite probable that theyards will presently be very indifferently off for work. The Scotch malleable fron trade is for work. The Scotch malleable fron trade is languid, few of the establishments in that branch being even moderately active. The strike of Scotch miners has been settled on the masters' terms, the men having "caved in" pretty nearly everywhere.

TRADES OF SHEFFIELD.

TRADES OF SHEFFIELD.

There is very little change in any one branch of business here. The heavier trades are slack, but are somewhat perturbed by the strike of 20,000 miners in the district. This strike may, if lasting, disturb the local from and steel trade somewhat, but as yet has not proved of serious moment. I hear of one or two of the steel works being moderately well employed; but, generally speaking, there is no alteration worth noting. For cuttery a few speculative orders are to hand from the United States. They relate to large cuttery, such as ivory carvers and the like; but are not very bulky. In razors, special sorts of shoe, butchers', &c. knives, a fairly good business is usually doing, and the present time is no exception to the customary state of things. A local newspaper thus describes what is termed a "patent rotary pensifie:"

"Mr. Wm. Staniforth, designer and modeller.

scribes what is termed a "patent rotary penknife:"

"Mr. Wm. Staniforth, designer and modeller
to Messrs. Fenton Bros., silversmiths, has ingeniously devised a knife which, so far from
scrificing utility to novelty, combines the two,
and introduces a feature to which we have
hitherto been unaccustomed—an arrangement
for preserving the blades from dust and dirt
that cannot but be contracted in ordinary use.
The knife is fitted into an ornamental circular
case, which, revolving, conceals it from view,
displaying instead of the blades a front of pearl.
When in this state of repose there is nothing
to indicate that the article is a knife, and it is
impossible for dirt to enter. A gentle pull and
a slight turn, as simple as the opening of a
pencil case, reveals the blades ready for opening
in the usual manner. The contrivance is elegantly fitted."

REPORTED FAILURE OF DANKS' FURNACES.

REPORTED FAILURE OF DANKS' FURNACES.

What some of the newspapers here are pleased term the "signal failure of Danks' puddling furnaces" is alluded to in the fourth report of the directors of the North of England Indus-rial Iron and Coal Company (Limited), which had been expected with much interest, as giving some authentic information regarding the results obtained by working the Danks' patent puddling furnaces. The company has patent puddling furnaces. The company has ironstone mines at Aylesbury and near Guisborough, in Cleveland; coal mines and coke ovens at East Howle, and blast furnaces with Danks' patent puddling furnaces at Carlton, in the county of Durham. The nominal capital of the company is £250,000, of which £179,975 is the county of Durham. The nominal capital of the company is £250,000, of which £170,975 is paid up. An interim dividend of 2½ per cent. was paid in January last. In the report just issued it is stated that the gloom which has overshadowed the fron trade during the past six months has affected the company so far as to transform the fair profit realized during the first half year into a loss of £15,922,16/3 on the aggregate transactions. aggregate transactions of the twelve me and sudden fall in the value of pig iron, the great depreciation in the market price and the great depreciation in the market price of the stocks of pig iron and raw materia! on hand, as valued April 30th. The company has also suffered, in common with other firms, from the signal failure of Danks' patent puddling furances, as originally constructed, to yield the profitable results that were to be expected from the statements of the patentée, corroborated as they were by the report of the commissioners appointed by the English iron trade to visit America, and there in ourse just the working of they were by the report of the commissioners appointed by the English iron trade to visit America, and there inquire into the working of the furnaces. Efforts are now being made to adapt the furnaces to Mr. Crampton's system of heating by the ald of coal dust, and the directors still have the utmost confidence that the alterations, improvements and additions will chable them to produce a quality of from superior to any yet obtained from Cleveland ores; and on the revival of trade they hope again to obtain profitable returns from the manufacture obtain profitable returns from the manufacture of pig and malleable iron.

BOARD OF TRADE RETURNS FOR JUNE. These returns for June are again of consid-ble interest. The total declared value of footts for the month was £19,367,613, which \$292,470 less than in June, 1873, and 6,008 less than in June, 1873. The total ue of the every for the strengths and

ooi, moun	10, 1010.			
	COAL	, COKE, &	C.	
	June	ending 30th,	June	ending 30th,
	Quantities.	Values.	Quantities.	
To	Tone.	£	Tone.	£
Russia		85,448	117,397	103,289
Swecon an				
Norway	. 76,686	78,514	74,224	62,509
Denmark	. 64,985	61,980	59,211	45,987
Germany	. 151,304	150,095	209,203	166,767
Holland	48,295	52,646	48,346	45,570
France	. 190,678	178,715	171,196	131,952
Spain & Ca	-	-10,120		
naries	. 51,898	61,479	87,930	39,649
Italy	61,784	61,807	56,428	50,792
Turkey	. 12,641	13,584	15,672	14,775
Ecypt	51,565	55,796	84,507	81,856
Brazil	. 25,739	28,585	26,054	26,098
Malta	. 22,681	25,148	16,177	14,192
B'tish India	38,104	42,548	39,117	86,834
Other coun		20,020	00,221	00,000
tries		208,505	161,763	161,858
	. 400,000	200,000	204,100	101,000
Total.	1,069,612	1,099,233	1,087,125	931,048
-	SE 14			

From the above it appears that, comparing last month with June, 1873, the exports have in creased about 25,000 tons in quantity, but decreased £168,185 in value.

		onths er	ided Jun	e suth.
To	Quantity.	Value,	Quantity.	. Value.
Russia	. 349,559	874,492	354,206	829,884
weden and No	r-			
way	. 881,778	405,976	391,864	853, 390
Denmark		286,114	306,393	265,806
Jermany	702,812	725,816	881,758	759,099
Iolland		212,332	188,430	176,773
rance				968,50
spain and Cana		(13.5	
raes		408,399	315,330	345:984
taly		412,809	399,668	386,200
urkey		121,260	143,098	141.06
Sgypt	. 300,420	328,185	802,148	804,189
Brazil	144,775	172,969	195,527	214,784
falta	121,861	135,256	139,502	144,589
British India	198,793	221,642	218,674	216,98
Other countries	4 000 004 1			

Total.........6,018,910 6,410,588 6,171,526 5,823,254 The above table shows that for the past six months the exports were 152,616 tons more in quantity, but £587,334 less in value, than for the

			rue, the	in for the
EXPO	TS OF I	RON AND	STEEL.	
10 10 40				ne 30th.
11121 1			Q'tity.	Value.
Pig iron Bar, angle, bolt		4,009,471	319,898	1,661,387
and rod	150,305		114,485	1,472,500 5,494,764
Hoops, sheets,		-	241,401	-,,,,,,,,
armor plates	108,440	1,937,721	68,809	
Cast or wrought.	140,664	2,710,120	129,652	
ture			14,558	90,489 570,769
Manutactures of				
	-	-		367,024
	Pig iron. Bar, angle, bolt and rod. Railroad. Hoope, sheets, and boiler and armer plates. Tin plates. Cast or wrought. Old, for manufacture. Unwrought steel unwrought steel.	EXPORTS OF D Si Q'tty, Ton- Pig iron 634,745 Bar, angle, bolt and rod 150,305 Railroad 347,757 Hoops, sheets, and boiler and armor plates 66,843 Cast or wrought 140,664 Old, for manufacture of 140,664 Unwrought steel 20,652 Manutactures of 160 and steel 5,314	EXPORTS OF IRON AND 6 EXPORTS OF IRON AND 6 Six months e 1873. Q'tity. Value. Pig iron	Six months ended July 1873

It is rather alarming to find from the preceding statistics that for the last six months, compared with the same period of 1873, the exports of iron and steel have fallen off 360,347 tons a quantity, and £3,381,244 in value.

HARDWARE AND CUTLERY

	Month 30th	ending June,	endi	months ing 30th une,
_	1873.	1874.	1873.	1874.
To	£	£	£	£
Russia	20,424	14,676	71,512	46,151
Germany	28,705	16,469	174,077	131,539
Holland	10,977	7,709	58,056	49,324
France			75,438	66,571
Spain and Canaries		9,826	49,897	54,029
United States		39,047	412,852	303,935
Spanish West India				,
Islands	10,140	3,660	73,571	31,428
Brazil		21,175	142,566	125,590
Argentine Republic		15,052	103,592	69,986
British N'th America.		26,301	108,032	111,345
British India		25,428	98,711	151,841
Australia		56,229	2:0,956	295,257
Other countries		99,716	776,729	645,681
Court Countries	*****	50,110	1101100	0.10,001
Total	979 497	946 949 9	499 410	0.000 665

In last month the shipments of bardware and cutlery were £31,484 less than for June, 1873; and for the last six months £345,752 less than for the corresponding period of 1873.

My usual detailed returns as to railroad iron have not yet reached me, and cannot, therefore, be given in this issue.

NEW WAR SHIPS.

The British government still continues to spend enormous sums of money on iron armored ships—vessels which are costly experiments, and are likely to be of little use in case of war. The last report from Hull states that the Earle's shipluiding and Eugineering Company, Hull, has just received an order from the admiralty to build two large screw composite corvettes of the Magicienne class. Each vessel will be 220 ft. long, 40 ft. in extreme breadth, of 1864 tons displacement. They will be very strongly framed in irons, and the bottom will be formed of two layers of teak planking, each 3½ inches thick, which will be secured to the fron frames by yellow metal nut and screw bolts. The bottom will be coppered over, so that when completed these vessels will have the same external appearance as a wooden ship. Each vessel will carry fourteen 64-pounder guns. The British government still continues to

weight from the patenties, corroborated as cere by the report of the commissioners below the English iron trade to visit a, and there inquire into the working of maces. Efforts are now being made to the furnaces and additions will them to produce a quality of iron superactive to the to the furnaces and additions will mouth, only two furnaces are in blast, and at the profitable returns from the manufacture and malleable iron.

DARD OF TRADE RETURNS FOR JUNE.

DARD OF TRADE RETURNS FOR J WELSH IRON AND TIN PLATE TRADES

of £7,555,343, compared with the corresponding period of last year. The coal exported was 1,087,425 tons, of the value of £1,094,235 in 1,087,425 tons, or the value of £1,094,235 in 1,087,425 tons, against 276,892 tons in 1,087,425 tons, against 276,892 tons in 1,087,425 tons in quantity, and £28,29,595 in value, compared with 20,992 tons in 1,087,425 tons in quantity, and £28,29,595 in value of the cotton mandal and the property of the second of the product of the cotton mandal and the property of the second of the product of the cotton mandal and the property of the second of the product of the cotton mandal and the property of the second of the product of the cotton mandal and the property of the second of the product of the cotton mandal and the property of the second of the product of the cotton mandal and the property of the second of the product of the cotton mandal and the property of the second of the product of the cotton mandal and the product of the cotton mandal and the product of the cotton mandal and the product of the second of of the secon aware whether other districts are autering from what we are doing, or whether we are opening up altogether new ground. The fact, however, is, as I have stated it; and the firms most advantaged are those whose products have already secured for them a name of much repute in the market."

This, se non e vero e ben trovato!

THE METAL MARKET. Messrs. Von Dadelszen & North's usual

Messrs. Von Dadelszen & North's usual weekly report says:

Copper.—The charters for the whole of the month of June were telegraphed last Monday as 2900 tons. In spite of this the market has been dull, and but very little business has been done. Chili bars £78 to £78. 10/, cash, and £79, three months prompt. Wallarov, £89 to £30, cash, English remains dull. Tin.—The Dutch Trading Company have announced their bl-monthly sale for the 29th instant. It will consist of 22,100 slabs Banca. There is hardly anything doing here. Straits is nominally £39 to £100; Australian, £97 to £38; English steady. The Banca price in Holland is 58th, spot; 57th. ex the approaching sale; Billiton, 56th. Tin Flates.—Some of the works have been opened this week, and others will follow in the course of the next ten days. The price of plates is of the next ten days. The price of plates is unchanged. Lead remains firm, at about £21. 5/. Spetter.—Nothing reported in the market. Prices for Silesian are quite nominal. Quick-silver, £19. 15/per bottle.

Heating and Ventilation in the New Post Office Building.

As may be supposed by any one who has een it and desired a correct idea of its great size, the heating and ventilation of the New Post Office building, in this city, is a work involving the employment of not a little engir cering skill. The apparatus is made from designs by Mr. M. F. Davidson, of No. 36 Cortlandt street, and the work of putting it up has been performed under the direction of Mr. Conners. We have not space to describe the work in detail, but a few facts respecting it will interest our readers. The heating will be accomplished by steam

from eight boilers, each 6 feet in diameter and 15 feet long, divided into four sections in nests of two. They can be detached so that one can act independent of all the others. No idea can be given at present of the amount of fuel needed to generate sufficient steam for the building. Attached to each section are two stand pipes, carrying four gauge cocks each. One of every four of these cocks is for steam. The water gauges and cocks are combined. Four brass pumps (one to each section), supply the boilers with water, and are so arranged that when necessary one pump can be used for all the boilers. Each pump has a stroke of 8 inches, and is capable of pumping 300 gallons of water per minute. The water is drawn through two 4 inch pipes connecting with the street mains, and are supplied with meters. These pumps can also be employed to fill the four large tanks which supply the building with water. Each of these tanks is 34x5 feet. Connecting the four sections of boilers with two 12 inch mains, are four 8 inch pipes. These mains are so constructed that one can be used without the other, and are, respectively, parallel with Broadway and Park Row, one being on each side of the building. At right angles to the above mentioned mains are two others, one at the Herald building front of 10 inch, and one at the Park front of 8 inches. These four mains and connecting pipes are fitted with expansion joints. Extending from these are 60 direct. 21/4 inch rising pipes, with 2 inch return pipes. each provided with a valve to shut off, so that if one should get out of order it could be renaired without interfering with the others. There are, also, forty-eight indirect heating pipes, twelve in each corner, beside four in the enter. There are forty-one 1% inch drins. with a 5 inch main return, which is connected with the boiler by four inch pipes. All this extensive work is placed in the capacious subthe upper stories will be rarified by placing coils Monday morning, assures us that he found, on raised to 140° Fahrenheit. As an instance of amount of shipping than was to be seen in the

Prof. Nessler states that a short time ago Bayarian brewer complained to him that recent ly his beer was no longer clear. During the three or four days per week which he brewed, the beer brewed the first day was the worst in this respect. In the brewery men tioned there was a zine cover over the kittle on which the water condensed and dropped back into the wort. An analysis showed that this water contained a great deal of zinc; zinc would even be detected in the boiled and un fermented wort.

In another case there was a large zinc pipe over the ketile to conduct away the vapors, and there was a zinc cover over the cooler. From the zinc pipe a large quantity of condensed water flowed back into the kettle, and an examination of this water also showed that it contained considerable quantity of zinc.

We cannot decide with certainty from this that the relatively small quantity of zinc caused of property destroyed in them at \$5,080,000. the turbidity noticed in the beer. The circumstance that the beer was more turbid, when brewing had been suspended for a day or two, would indicate this, for while the brewing was suspended the zine might oxidize and unite with carbonic acid, and on this account more insurance rates on the property destroyed—there zinc could be dissolved at the first boiling than on a subsequent operation. One brewer re- \$5,000,000 worth of property. In 1871 the moved the finc cover, and the other conducted off all the water condensed on the pipe; after \$2,000,000 would have bought and paid for this the beer was as clear as before. Aside taking down every wooden building destroyed from the fact that z'nc renders the beer muddy, care should also be taken to prevent water. dropping off the zmc, because it is certain that we prepare the fuel for these frequent consuch water may contain much zinc, and solutions of zinc are injerious to the health.

Ashtabula.

The following gratifying account of the business prosperity of Ashtabula, is from the Tele raph of that city, under date of the 25th inst. :

Ashtabula harbor never presented such a sight as on Sunday and Monday last. The number of vessels lying at the docks on Sunday was not so great as on Monday, but the sight was more attractive and gay from the numerous flags, both British and American pennants, Union Jacks, &c., that were flying from their mast heads. Monday, however, presented the largest number of ves:els, there having been several arrivals during the night of Sunday, and Monday morning.

The number of schooners, two and three mas ers, all told was eighteen. The majority of these were ladened with ore, and six or eight of the number with Canada ore. Beside these three were two tugs, belonging to the harbor, and the large propeller W. H. Barnum. This propeller and several of the sailing vessels were among the larger sized crafts-some of them carrying over one thousand tons of ore, while others ranged from one hundred tons down to some three or four. The Canada vessels, coming as they do through the canal lock, are no essarily small. These vessels are engaged in the ore trade between this harbor and Marquette, Escanaba, L'Anse, &c., of the American ports, and Kingston and Cobourg, of Canada. While the vessels from Canada come loaded with ore. generally, they return with coal to Port Colburn, Toronto, Hamilton and other points, thus ex changing the products of the British miners for those of the States, and mainly of our own State.

This amount of shipping begins to crowd matters a little, and shows to our A. Y. & P. folks the necessity for more room for the growing business, that even in these sluggish times is seeking accommodation at this port. It is also a forcible argument for putting forth the utmost energy by the L. S. and M. S. Co. in the building and completion of their docks, and the furnishing of facilities for the amount of commerce that it has become evident will make this port its point of business. The first officer of the Morey, who left Cleveland on his arrival at Ashtabula harbor, a larger

It will thus be seen in this, our first whole season of business, we have already eclipsed The arrangements for ventilation are very the port of Erie, and are crowding the port of perfect and complete, long cast iron columns Cleveland. That which is needed, then, is the in the building being made to do duty as a facilities for business, and the question of its means of carrying off the vitiated air. Mr. finding its way, and centering here may be

The importance of Ashtabula harbor, as a of Mr. Moran. In the sub-cellar are placed lake port, is not among the contingencies of

Tinning Brass, Copper and Iron

Dr. Archleb's process for tinning metals consts in the use of tin salt (stannic chloride) and ine dust. The articles to be tinned must be perfectly clean and bright, especially must they be free from grease. The tin salt is dissolve in 10 parts of water, and to the solution i added some tartaric acid and zinc powder Zinc fillings may be substituted for zinc dust, or the latter can be obtained by fusing the zin in a crucible, pouring it out into a warm mortar and as soon as it begins to solidify, pounding with the pestle, for in this condition it is very brittle. When cold it should be passed through a sleve to remove the coarser particles.

The tinning is performed as follows: A cloth dipped into the tin salt solution, and the article to be tinned rubbed with it: the same cloth is then dipred into the zinc dust and the object rubbed with that, considerable pressure being applied. The tin appears at once. rubbing alternately with tin salt and zine dust must be repeated until the whole object is snfficiently tinned, when it is washed with water, then dried and polished with a dry cloth dipped in fine chalk.

Weight of a Square Foot of Copper, Lead, Brass and Zinc.

FROM 1-16 to 1 INCH IN THICKNESS.

Thickn.	Iron.	Copper.	Load.	Brass.	Zinc.
Inch. 1-16.	Lbs. 2:517 8*1 85 7:858 18*106 15*106 15*106 25*1141 22*659 25*176 30*211 32*729 35*24*40*282	Lbs., 2:89 5:781 8:672 11:562 14:458 17:344 20:234 20:125 26:016 28:906 37:578 40:48	Lbs. 3 691 7 392 11 074 14 7 6 18 456 22 148 25 839 29 58 33 222 36 913 40 604 44 296 47 967 51 678 58 87	Lbs. 2 675 5 35 8 925 10 77 18 375 16 96 18 725 21 4 24 975 29 425 32 1	Lbs. 2:34 4:68 7:09 9:36 11:7 14:04 16:34 18:72

The Chicago Tribune gives the cost of frame buildings recently destroyed by fire at Streator and Chicago, Illinois, Oshkosh, Wisconsin, and Iowa Falle, Iowa, at \$350,000, and the amount Commenting on this, the same paper says: Placing the difference in the cost of these wooden buildings and the brick ones at 20 per cent., the sum saved was \$70,000, and economize this sum-not equal to three months' was wantonly and criminally sacrificed over sacrifice in this city alone was \$200,000,000, when in that fire. This is the penalty we have paid, and which we must continue to pay, as long as flagrations,"

Improvement in Furnaces and Grates. Mr. J. W. T. Cadett, of Rosherville, England, has lately been granted a patent for an invention which consists mainly in an arrangement whereby, when fresh fuel is put on the fire, the smoke and other products are prevented from rising from the top of the furnace and passing off to and through the chimney, but the heated products of combustion are compelled to proceed from beneath the burning fuel, and thence to heat chamber or chambers, passage or passages, finally escaping by the

London Metal Market.

28 88 98 98 88 88 ralfan 0% 0% 0 Wire.
Tubes...
Yellow Metal Sheathing... Speiler # ton.
Foreign on the spo'
to arrive.....
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In Sheets Onick-liver b bottle. 19 15 fin—♥ ton. glish Blocks..... tto Bars (in bris.)...... tto Refined..... 100 101 103 H 8 100 Canada Plates \$\text{ton. 19} \text{ton. 19} \text{at works.} \text{18} 16 Fron-Fton.
Bars Weisn, in London.... 9
to arrive..... 9 9 15 0 Nail Rods, Staff'd in L'ndon il 11 14 13 11 18 15 6 9 10 10 10 10 10 0 Bars at Worse.

Sheets, single, and plates.

Sheets, single, and plates.

Sheets, single, and plates.

Sheets, single, and plates.

Bars, common ditto.

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Ditto, Bailway, in Wales.

Ditto, Bailway, in Wales.

Ditto, Sheets, in London.

To arrive.

Pig. No. 1, in Ciyde.

Ditto, to.b., Tyne or Tees.

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Steel-+ 100.

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Brick and Soapstone Stoves in New Eng. same bed. Near the surface and frequently for

To the Editor of The Iron Age: The artiele in a recent issue of The Iron Age upon the Swedish stoves, brings to mind a brick tions of the United States. In the northern and middle parts of the State of Maine it, is known as the Russian stove-possibly because. like the stoves of that country, it is a fixture in the house. Externally, the appearance is that of a narrow and high brick box, set flat side to the chimney, from which it is distant from six inches to a foot and a half, or even two feet. The length is perhaps four feet, and the hight about the same. The width is usually two feet, or great enough, in some cases, to admit of setting a door 18 inches high by 10 or 12 tougher in fibre, owing to its slow and stunted inches wide, in the end. Some stoves are built growth, all of which lessen its value as a fuel. inches wide, in the end. Some stoves are built so long that cord wood may be put into the fire box, in which the end door opens. When this peat has been produced from mosses is probably is done the labor of sawing and splitting is eaved, and the wood is used just as it comes from the forest. The top of the stove is generally covered with a slab of stone a couple of inches in thickness. In the upper part of the water; also of oxygen and carbon to form front side is a door opening into the oven. The outside of the stove is of fine pressed brick, sometimes painted a dark, warm color. The hydro-carbons, the main feature of this change flues, though by no means as long as those of being the increase in the smount of carbon in the Swedish "kakelungs," are arranged so as to inclose the oven, which fills the upper part depend upon the extent to which this change of the stove, and in passing through them the has advanced, peat when slightly altered apheat is pretty thoroughly extracted from the proximating to the texture of ligneous tissue gases. Combustion in these stoves is very slow, the end aimed at being to get a large body of mating to that of lignite, coal, or other bituwood on fire, and then, cutting off the draught, minous minerals both in physical characters and allow it to burn until it is reduced to charcoal, the great body of hot fuel giving off heat for twelve or fourteen hours at a time without needing a fresh supply.

Masons who could build stoves of this kind, and give them a good draft so that they would duty every year. In that country peat is diwork successfully, were always highly esteemed and much sought after. The oven, which is always hot, is highly prized because of its low, steady heat. The famous brown bread, "rye and Indian," and pork and beans of the Eastern States, are certainly never more delicious than when baked for fifteen or sixteen hours in one of these ovens.

In comfort, during the intense cold of the winters, these stoves are much superior to either hot air furnaces, or any description of wrought iron stoves. The heat is of the very character most desired, of low intensity but of great quantity.

The bricks, while allowing the heat to pass, reduce its intensity, and, at the same time, prevents gases from within passing into the room to a perceptable extent. The difference between the air of a room heated in this serious obstacle to the useful application of way, and that where cast iron stoves or hot peat fuel upon an extensive scale arises from air furnaces are used, is very marked to the

are employed, and are highly prized because of the pleasant character of the heat from them. In this respect they are like the Russian stove just described. These stoves are made from slabs of soapstone or stealite, about an inch half a dozen ever attempted to work upon a thick, held in place by a frame of iron. Those scale so large as to prove their practicability. which I have had an opportunity of examining Mr. Plant than gives short abstracts of the were plain boxes, capable of containing a considerable quantity of fuel, and of burning it time before the public, and the general conclueconomically. They are very heavy, and, owing sion at which he has arrived is that in places in to the fragile nature of the material from which Great Britain where coal is scarce and dear, and they are made, easily cracked by blows. They peat abundant, peat fuels could very well be ere also quite expensive, and are on that account not so much used as they would otherwise be.

They are somewhat of a luxury. These facts fuel in a competition are very small. The heatthe best from which to construct the radiating weight, one-half that of coal, therefore the surfaces of stoves and other heaters for dwel-The total quantity of heat passing through one conductor will be the same as that passing through the other, but in one case it will be much slower than the other; and this slowness seems a great element in the production economical and agreeable heating. I can bear witness to the remarks of the writer in the article referred to, in relation to the economy of heating in Northern climates, and also force exerted is so enormous as to overcome the superior comfort of rooms heated in the the resistance of any pipe or vessel yet conmanner described. Furnace heat is not to be structed. Mr. Calantarients solves the difficulty think not in point of expense. Certainly the quantity of coal consumed by a family in the side is a little more than equal to the increase ir extreme north, in towns where coal is used, is not greater than in New York, size of houses and other points being equal.

W. E. PARTRIDGE.

Peat Fuels and their Economic Value.

A highly interesting paper, giving an account of what has been done toward the utilization of peat, was recently read before the Manchester Geological Society by the konorary secretary, Mr. John Plant, F. G. S., the principal object being to give an account of the peat fuels in the exhibition of scientific industry at Peel Park, 1874. Mr. Plant remarks that the surface covered by peat beds in England is considerable and widely scattered, except in the Midland counties: it is much greater in Scotland, but most extensively seen in Ireland. The peat bogs of Ireland are estimated at 2,881,000 acres, those of Great Britain at 3,500,000 acres, giving the total extent of peat in the British Isles equal to, in round numbers, 6,000,000 acres; and if, says Mr. Plant, we accept an average thickness of 12 feet deep over this enormous area, and each acre as capable of justly regard this as a powerful auxiliary to keep up the steam-producing power of Great Britain, and to some extent help to stave off the day of the exhaustion of its coal fields.

Although bogs and mosses are mainly alike

a depth of about 5 ft., the ligneous fibre is per fectly discernable, and from thence downward to a variable depth the vegetable fibres may be traced through various stages of decay until at the bottom all traces of vegetable fibre are stove much used in some of the northern por- lost in the complete decomposition which has been brought about by time and chemical change. The denser portion which forms the lower stratum of a bog is the most valuable; it s easy to work, and when dried it abounds in inflammable materials, it makes the best fuel, and burns like bituminous coal. The peat of the high moors and mountains is generally more impure than the peat of the plains, owing to the amount of disintegrated rock which from atmospheric influences, gets disseminated through the peat; then, it is harder and The chemical nature of the change by which very similar to that by which bituminous minerals have been formed from analogous materials. It consists chiefly in elimination of oxygen and hydrogen in the proportion to form carbonic acid, and of hydrogen and carbon in the proportion to form marsh gas and other the residual substance—the varieties in peat or wood-and with greater alteration approxiir composition.

In Holland the making of peat fuel is a great and lucrative industry; above 40,000,000 tons of hard peat fuel are made annually, and £140,-000 is paid to the Dutch government as excise vided into four classes-long turf, a dry, light, and very fibrous material obtained from the high fens, which is cut into long slabs and air dried; this sells at from 13/to 19/the English ton; short turf, obtained by dredging the water covered turbaries; it is well kneaded by treading it under the wooden sabots of the workmen, cut into short bricks, air dried, and sold to the hotels and upper classes for 14/ to 19/ per ton; derrie turf, obtained from the coast lying under the sand dunes, about the same value as the preceding; and, lastly, rah der turf, a machine manufactured peat fuel. produced by a process similar to Clayton's. The cost of making rander peat fuel is 6/6 per tons; it pays a heavy excise duty, and sells for about 10/ per ton at the works, and 19/ per ton at Delft, 100 miles from the works. The most the large amount of water held in the peat in its natural state, and in the practical difficul-In some parts of Vermont soapstone stoves ties of effectually separating this water by any quick heat-drying processes. There exists al ready above 100 patents for the making and converting raw peat into fuel for steam and domestic purposes, and of these not more than several processes which have been from time to sold at a good profit; but where, as in Lancaseems to point to a slow conductor of heat as ing power of peat fuel is just, weight for former cannot bear the cost of carriage.

Water Pipes and Frost.

J. A. Calantarients, surgeon, Scarborough, has patented a simple but ingenious method of pre venting water pipes from being burst by frost. Water, in freezing expands about a twelfth of compared with it in point of comfort, and I by passing through the water pipes an Indiavolume of the water by freezing. There is thus secured in the inside of the pipe a space equal to the difference of volume between water ice-the proportion being 1083 to 1000-so that when the water freezes and expands it occupies the space thus reserved for it instead of exerting its force on the pipe. The India-rubber tube is always kept full of air, so that when the water freezes it finds at every point the necessary space to occupy, for by compressing the tube it dis-places the air and takes its place. Again, when the ice melts, the air-tube expands, ready to be acted upon by another frost. The air is supplied from a reservoir, which is acted upon by the water pressure, so as automatically to put the air-tube under an exactly corresponding degree of tension. By heating the air in the tube the water in the pipes can be thawed. This application is peculiarly useful in the case of waterclosets, and in preventing the supply of cold water to engine-boilers becoming interrupted by frost. Not less important is that the invention can be applied to preventing the explosion

There is little doubt that we have here a cheap but effective remedy against a fertile and long standing source of discomfort and damage. Insupplying 12,000 tons of peat fuel, we may cidentally, security against the bursting of water pipes during frost will likewise facilitate their more convenient disposition throughout a house, and permit the use of much lighter and consequently cheaper kinds; while it has been proved, by repeated experiment, that the invention rein their general character, yet there are difference between them, and much difference between the peat cut at different dep he of the

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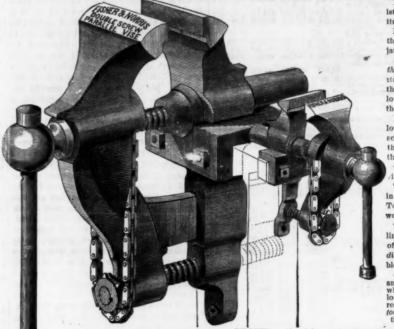


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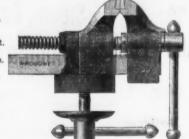
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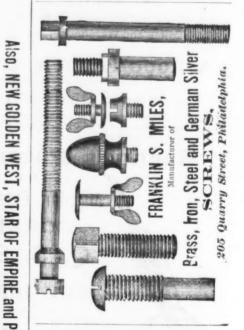
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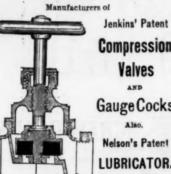
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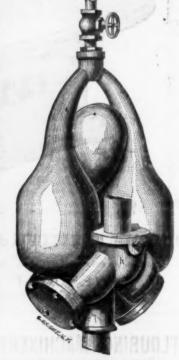
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and Index to Advertisements.

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Benedict & Burnham Mrg. Co., Waterbury. Conn., 2
Rrocklyn Brass & Copper Co., 100 John, N. Y.

Manhaitan Brass Co., 83 Reade, N. Y.

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Sovill Mrg. Co., 40 Chambers. N. Y.

Sovill Mrg. Co., 4 Beekman N. Y.

Waterbury Brass Co. 23 Heekman N. 1, 2

Brick Pressess. Makers of
Carneli Geo., 1819 Germantown Ave., Phila., 23

Carnell F. L. & D. R., 1344 Germantown Ave., Phila., 23 Bridge Builders.
Moseley Iron Bridge and Roof Co., 5 Dey, N. Y.... Butcher and Shee Knives. Manufacturers of. Wilson John, Sheffield, England. Burr Stone Flouring and Grist Mills Cabinet Hardware, Manufacturers of, Landers, Frary & Clark, 298 Broadway, N. Y. Corriage Bolts, Makers of. Townsend, Wilson & Hubbard, Phila. Smith H. D. & Co., Plantsville, Ct., Car Wheels. etc., Manufacturers of. Jackson & Woodin Mig. Co., Berwick, Pa. Taylor Iron Works, High Bridge, N. J.... Castings.
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Shapley & Wells, Binghamton, N. Y.
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Tumor R. A., 37 Chambers, N. Y.
Windmuller Louis & Roeiker 20 Reade N. Windmulic Louis & Roeiker 20 Reade N. Y.

Hardware Manufacturers,
Biddle Mfg. Co., 38 Chambers, N. Y.

Enterprise Mfg. Co., 67 Chambers, N. Y.

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Enterprise Mfg. Co., 66 Chambers, N. Y.

Jacobus & Nimick Mfg. Co., 96 Chambers, N. Y.

Kellogg Wm. P. & Co., Troy, N. Y.

Lane, Gale & Co., Troy, N. Y.

Many & Marshall. 8 Warren, N. Y.

Miller's Falls Mfg. Co., 58 Beckman, N. Y.

Miller's Falls Mfg. Co., 68 Chambers, N. Y.

Shattuck W. F. & Co., 113 Chambers, N. Y.

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The Wethersheld Novelty Co., Wethersfield Cl.

Turner & Soymour Mfg. Co., 69 Chambers, N. Y.

Union Mfg. Co., 50 Chambers, N. Y.

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Fuller, Dana & Fitz, 110 North. Boston
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Paeljes, Douge & Co., Cliff, bet. John & Fulton, N.
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Gilbert, Bennett & Co., 237 Feart, N. Y.
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(Concluded).

The "brasses" are made of the best ordnance bronze, as are those of all other bearings. They are filled with anti-friction metal. The crosshead bearing is 11 inches in diameter and 14

The main frames are of cast iron. They give large bearing surfaces to the cross-head gibs. These frames are secured to each other, and are well braced by cross-ties and rods from opposite engines

The crank shafts are forged in three pieces connected by crank pins and cranks, which were forged separately, carefully fitted, and then forced together so firmly as to give all the rigidity of a single piece. The total length is 24 feet 91/4 inches. The diameter of each crank shaft is 16 inches. The intermediate bearing is journals are 16 inches in diameter and 21/4 feet

The crank pins are of steel. Their journals are 15 inches in diameter and 15 inches long. They have ample strength and area of rubbing surface.

A surface condenser is attached to each pair of engines. The tube plates are in place, and the whole condenser is complete and in position, with the exception of the tubes. These are not ordered. The total area of refrigerating surface in each is designed to be 6325 square feet. or a total for both condensers of 12,650 square feet. The ratio of this area to that of the heat-

ing surface of the boilers is $\frac{12650}{28000} = 0.449$, of which the inverse ratio is 2.29, and the ratio of cooling surface in the condensers to the area of grate surface in the boilers is nearly 141/4 to 1 This area is more than ample for the amount of work to be done. Each condenser is to contain 4198 tubes, each 9 feet 6% inches long and 5% inch diameter.

The circulating pumps are of the centrifugal variety, 6 feet 8 inches in diameter, and having a width of opening at the periphery of 3 inches. One pump is attached to each condenser, and is driven by a pair of small engines.

The air pumps, one to each pair of engines are 44 inches in diameter, and have 27 inches stroke of piston. They are driven by a beam taking its motion from the main crosshead of the after engine. These pumps are of the "bucket and plunger" variety. The bucket and the plunger are of bronze, and are in one piece. The valves are of India rubber, with seats of composition like the bucket.

The feed and bilge pumps, one of each to each pair of engines, are driven by a crank at the forward end of the main crank shaft. They have trunk plungers of "composition," 14 inches in diameter, with a stroke of 18 inches. The valves are of rubber, on composition seats, and are conveniently accessible.

The engine room occupies 851/2 feet in the length of the vessel very nearly amidships.

The line shafting is coupled to the crank shafts by clutch couplings. The shafting is of wrought iron, turned to a diameter of 151/4 inches.* Its length is 131 feet 4% inches. It is in four sections, secured together by wrought iron couplings. That part of the shafting extending outside the vessel measures 69½ feet. It is supported by hangers.

The thrust bearings are situated at the inboard end of this line shafting, adjacent to the clutch couplings. Their length is 41/4 fcet. They have ninteen collars each. The directions of the shaft lines are divergent, their center lines being 10% feet apart at the engines and 16 feet 81/4 inches at their outer ends, a divergence of 0.4366 inches per foot. They are also 14 inches lower at the outer ends than at the engines, this inclination being 0.164 inches per foot.

The stern bearings sustaining the shaft, where they pass through the side of the vessel, are of cast iron resting in wrought iron forgings. They are lined with anti-friction metal. Line bearings support the shafting at intervals of 15, 18, and 20 feet inside, and of 30 feet outside the vessel. The screws are of cast iron. They are three bladed, "true screws," having a diameter of 18 feet, and a pitch of 27 feet. The length of hub is 31/4 feet, its diameter 34 inches. The total area of each blade is 27.197 square fect, of each screw 81.59 square feet, and of each "screw disc" 254.47 square feet. The engines are arranged to turn them in opposite

OTHER MACHINERY.

Blowing engines and fans are completed and n place at the after end of the engine room, and at the forward end of the boiler room These fans are each 8 feet in diameter and are each driven by one engine, having a steam cylinder of 16 inches diameter and 14 inches stroke of piston. Two very large blowers are also on hand and ready to be mounted in the space below the turret, where their driving engines are already set up. They are 5 feet 21/2 inches in diameter, and have a breadth of face 3 feet 81/2 inches. Their driving engines are single, with steam cylinders 16 inches diameter and 14 inches stroke of piston.

The anchor hoisting engines have been com pleted and set up in their place over the chain locker, immediately abaft the armored bulkhead near the bow. The cylinders are 14 inches diameter and 14 inch stroke. The anchor hoister, windlass, has not been built. A design was prepared, under the direction of the writer, by the late F. S. Thayer, of the Stevens Institute of Technology, which may be used, if considered suitable by the purchaser of the vessel. All of this machinery was built from Mr. Newton's drawings by the Delamater Iron

Works, of New York, and the material and workmanship are of unusual excellence. All material was paid for by the pound, and at prices fixed by agreement. All labor was similarly paid for by the day. The weight of

*This exceeds the diameter estimated previously safe for the crank shaft.

engines and machinery, as above described, is 500 tons.

BOILERS AND COAL CAPACITY.

There are ten steam boilers of the usual narine, horizontal, fire tubular type, with furnaces and combustion chambers below the tubes. The shell is rectangular in form, and well braced. These bollers are placed in one long fire room, or "stoke hole," and occupy 83 feet 8 inches in the length of the ship, the fire room running fore and aft. Each boller contains three furnaces, having a width of 3 feet 11 inches, and a hight, including ash-pits of 4 feet. No grates have been made. They are intended to be 81/2 feet long in the after, 61/4 feet in the forward boilers. The distance from the grate to the crown of the furnace is intended to be 231/2 inches in front, and 30 Inches at the back end. The front of each boiler is 13 feet 10 inches in length, and 14 feet 16 inches in diameter and 3 feet long. The end in hight. The depth from front to rear varies from 111/2 feet in six boilers, to 10 feet 11/2 inches in the two forward ones; the depth in intermediate boilers being 11 feet. Each boiler contains 432 tubes of 21/2 inches exterior diameter, and from 7 to 9 feet long. The upper row of tubes is six feet below the top of the boiler. The total area of grate surface is 876 square feet. The heating surface has a total area of 28,000 square feet, distributed as follows:

Tubes	 ,380 square fee
Furnaces	 .2050 "
Connections	 . 1890
Tube Sheets	 680 "
Total	 8,000

This high ratio of heating to grate surface should give great economy of fuel. The boilers have safety valves, and blow and feed valves, in place. The Kingston valves are made, but are not in place. The smoke flue is partially constructed. The funnel has not been made. The steam pipe leading to the engines is in place and complete. The boilers are secured in their places by substantial stays. Internally, they are stayed by braces 11/4 inch ound iron, spaced 12 by 12 inches apart. The shells of the boilers are of No. 3 iron, and the have been tested with cold water under sixty pounds pressure per square inch.

Their total weight, including valves and pipes, is 255 tons. The steam-power of these boilers is sufficient to supply moderately eco nomical engines of greater size than those to ordinarily observed in marine practice is from 2.5 grate surface for each horse-power, with forced draught. Under such extreme conditions heating surface, or for 4380 to 8760 I. H. P., as estimated from the area of grate. The more 14 inches, and in our own navy 15 inches. favorable conditions are those exhibited in the best of recent practice in marine engineering the less favorable are those of the practice of twenty years ago. As will be seen hereafter, this boiler power is sufficient for all probable demands, even under unfavorable conditions, the highest power estimated as required continuously to drive the vessel 15% knots, being but about 5650 I. H. P.

The coal bunkers are arranged in three groups-abaft the engines, between the engines and boiler compartments, and forward of the boilers. They are made water tight, and can be emptied and filled with water at pleasure. They these bunkers, the space above the boilers and inch shot. behind them is sufficient to stow 250 tons of coal, and the long fire room, or stoke hole, floor measuring 831/2 feet in length, and from 71/2 to to place coal to be used at starting. A forced draught is secured by making the fire room airtight and forcing in the air required to support combustion by means of the blowing apparatus already described. This method has been proven-if the personal experience of the writer on large naval steamers, etc., can be relied upon-to be much more effective and pits through closed pipes. This plan was introduced many years ago by the late Robert L. 5187.8, 5581.8, 6006 and 6854 tons. Removing Stevens. adopted. These boilers were built for Robert the vessel into a merchant steamer, the diswere designed. built. With such proportions as have been with a consumption of twenty pounds of coal, or more, per square foot of grate per hour.

PRESERVATION.

The boilers are painted externally, and have been thoroughly coated inside with fish oil which forms an impermeable glaze, perfectly the atmosphere. The engines have been carefully overhauled, and all "bright work" thoroughly coated with white lead and tallow. The inner surfaces of the cylinders have been given a have been kept well oiled. The machinery being set up, and its parts connected, the engines direction of the consulting engineer, to see that no parts were deteriorating. It is believed that all parts of the hull and machinery are in as good condition for work as when first put in place.

SPACE OCCUPIED AND WEIGHT.

The total length in the ship occupied by en-gine and bodler room is 119 feet 8 inches. The total weight of propelling apparatus and ma-

umery .	is, approxim	16	 60	٠,	7 1		u,	м	C		E.	o,	L	U	* 1	n	Ä	L	å	ē.		
	shafts, screw																					
Vater in	condensers .																				25	6.4
84	boilers				0 0		0		0	0				0	0	0	0	0		. 5	900	66
	Total					٥	0	0	0	0 0		. 0		0				0		. 8	180	ton

The weight of machinery has been obtained from the bills of foundry and forge shops, as furnished by the builders, with a de duction of 121/2 per cent. for loss of weight in finishing, and have been checked by measurement and independent calculation. Other weights are obtained by estimation from measurements and checked by independent calculation from independent measurements. The weight of the hull is 2000 tons, as deduced from a comparison of estimates with bills of material. The total weight of the vessel, now offered for sale, is 2755 tons, distributed as above.

ARMOR AND ARMAMENT.

No steps have yet been taken in the construc-

tion of either armor or armament. It was pro osed to cover the main deck with plating 13 nches thick fore and aft. The side armor is to surround the vessel, except at the bow. Thirtyfive feet from the stem, a heavy transvers bulkhead meets the side armor and carries the same thickness of protecting plating, and similar arrangement of backing. The thickness of armor plating proposed is ten inches from the level of the main deck down to a line four feet below, and thence five inches to the ower edge of the armor shelf. The backing is of wood, 44 inches thick. The inner course is of white oak, in heavy balks set on end, and thoroughly secured by a large number of bolts. The outer portion is of yellow pine timber laid horizontally and well scarphed together. The upper portion of the armor is also backed by the whole structure of the heavy main deck, against which the upper portion of the armor backing proper rests. The side of the vessel exposed above water can thus be made capable of resisting far heavier blows than it would be likely to receive in action from any guns afloat. The side armor and backing are carried on a shelf of iron plate. It is supported and secured to the hull by a sponson of half inch plate, by guesset pieces spaced three feet apart, and by an angle iron, at the line of junction with the hull, of 4x1 inch section. As a security against decay, the backing has been saturated with crude creosote, which was shown tube sheets are 7-16 inch thick. These boilers by Professor Renwick, and which has been proven by subsequent experience, to be an effective defence against the teredo as well as against rot.

THE TURRET.

The turret has not been constructed, and no detailed plans have yet been prepared. Bulkwhich they are to furnish steam. The range heads have been properly located to carry the weight of a turret and guns, and no obstacle exto 50 feet of heating surface to each indicated ists to the erection of the turret whenever it horse-power, and from 0.1 to 0.2 square feet of may be decided to place it on board. A turret has been proposed thirty feet in diameter, and the engineer has estimated on a thickness of these boilers would supply steam for from from 16 to 18 inches, the precise figure to be 5600 to 11,200 l. H. P., if estimated by determined by the amount of other weight carried. The heaviest armor yet made abroad is

The guns first proposed were two XX-inch U. S. naval smooth-bored guns, weighing 95,000 pounds each, throwing a shot weighing 1040 pounds, with a charge of 200 pounds of power. Rifles of XII-inch bore, throwing shot of equal or greater energy, would probably be sidered far preferable by the majority of ordnance officers. The energy of a shot of the latter description, on leaving the gun, may be estimated at about 10,500 foot-tons, and its penetrating power is sufficient to destroy plating 17 and 25 inches inches in thickness, with and without backing respectively. The magazine was designed to stow twenty tons of powder, have a total capacity for 800 tons of coal. In the shell room to receive fifty loaded shells, and addition to the amount which can be stowed in the shot-locker to stow two hundred twenty-

STORES.

It has been proposed to erect store rooms for six months' provisions for two hundred and 111/2 feet wide, offers a large area upon which fifty men. As a "Monitor," a somewhat less number of men should suffice.

> The water tanks are three in number. Two are in place and one is ready to go on board. They have a total capacity of 2800 gallons. DISPLACEMENT AND WEIGHT CARRYING CAPACITY

The displacement of the vessel, is carefully estimated by independent calculations by cross section and water line section measurements, onvenient, and far more comfortable than the taken from the hull itself after completion. old plan of leading the air directly to the ash At 20, 21, 22 and 24 feet draught respectively, the displacements, including armor shelf, are It is now becoming frequently the armor shelf for the purpose of converting ement would become, at the same They are of selected boiler plate, and are well lines, 4989, 5323, 5658-28 and 6329 tons. Completing the ship as designed, the draught would given these bollers, and with the arrangements be 22 feet and the displacement 6006.02 tons. here adopted, a good result should be obtained | The weight of the hull proper, and machinery when completed, will be not far from 3000 tons, or, including 800 tons of coal, 3800 tons, leaving for weight of armor, armament, stores and incidentals 2206 tons. Allowing 700 tons for the last two items named, there is left 1506 tons available for weight of armor and armament as protecting the iron from the oxidizing action of an iron clad. Or for cargo and additional coal, as a merchant vessel loaded to 24 fect, 2527 tons is allowed. The weight thus allowed for armor and armament is sufficient to cover that of side and deck armor, and, as already described with coating of black lead and tallow, and all journals turrets thirty feet in diameter, nine feet high, and eighteen inches thick, and to leave sufficient buoyancy to support the proposed armahave been moved, at short intervals, under the ment. Weights would therefore probably be

see	distributed as follows:	rection of her head would probably be reversed
ed	IRON CLAD.	while the work goes on, and the deviations of
in	Hull, including bulkheads, &c	the compass from local attraction would be re-
in	Machinery and boilers	duced to a minimum.
1.6.5	Coal	TIME AND COST OF COMPLETION.
		The unfinished work, as detailed in the in-
1	Armor, side and deck	
en-	Guns	ventory herewith submitted, may be done
he		readily in three months, and the vessel will
-	Total 6,005	then be in condition to steam across the Atlan-
a-	" MERCHANT STEAMER.	tic, if necessary. Should it happen that the
	Tons.	
ons	Hull and machinery	ship should be purchased with the intention of
DE COMP	Weight carried 3,000	taking it to Europe, it might be found advisable
14	Total	to leave a portion of the work of completion to
16	The vessel can readily be arranged for carry-	be done there. The difference between the
DYTE !	ing cargo in make ministraca punk as is required	cost of work of equal quality in the United

for special purposes, e. g. as in laying telegraph cable.

STEAMING TIME AND DISTANCE. The following is the speed, time and distance table, as estimated for the ship, at the draught, and with the co-efficients of performance as already given. The figures are given as a probably close approximation. Coal, 800 tons

Speed in Knots.	I. H. P.	Coal per hr. per I. H. P. Ibs.	Hours Run.	Days Run.	Distance, Miles,
16	6,000	2%	109	4.67	1,744
15	5,000	234	130	5.41	4,850
14	4,000	2%	163	6.78	2,282
12	2,000	3	299	12.46	3,488
10	1,200	81/6	427	17:79	4,270
8	800	4	560	23.33	4,480
6	600	436	876	29-82	5,256

The present capacity of coal bunkers is here taken on the assumption that it will be pre ferred to devote all surplus displacement to floating the maximum amount of armor, since it is probable that no long voyage will becom necessary at full speed. At the speed consid ered most economical for a naval vessel between stations, 6 knots, the number of hours steaming would be 876, or, a run of thirty days could b made, accomplishing a distance of 5256 miles without coaling. At this speed, the engines are estimated as consuming 41/2 pounds of coal per horse-power per hour, as such large engines would fall off greatly in economy when developing such low power. This assumed loss may owever, be excessive, as probably not more than two boilers would be worked.

As a fast passenger and mail steamer, the amount of coal carried would be increased, and full speed maintained. Double the assumed amount of coal being stowed, and full speed maintained, the voyage between New York and between New York and Queenstown in 71/2 days, with favoring winds and smooth sea. BEHAVIOR IN A SEA-WAY.

The lines of the vessel, and the form of the transverse sections, are calculated to give moderately easy motion in a sea-way. The stability is very great, and her motion would be quick, and somewhat uneasy, if completed with high free-board. All vessels of the monitor class. however, are found to behave well in the heaviest seas, even when not peculiarly well shaped. The hight of the metacentre above the center of buoyancy is 11.72 feet, and 15 2.85 feet above heeling angle of 15°, is $6000 \times 11.72 \times 0.2588 =$ 18,200 foot-tons, a higher value than is often obtained. This great moment of stability is largely due to the projection of the armor shelf. Removing this, the ship, as a merchant vessel, would have a metacentric hight of more nearly seven feet. The vessel would remain very stiff, and would be capable of carrying any amount of sail that could be put upon her STRENGTH OF HULL

The strength of the hull is very great, and it is capable of withstanding either local or generally distributed strains of extraordinary magnitude. The thickness of skin, as determined by the usual formula T=0.05 S VD=0.05 × 2× V 22 is properly 0.47, or 15-32 inch. The actual thickness is one inch in the one, and half inch in the other, of the two skins; and in the latter it is increased to one inch at the keel plate, to % inch in the garboard strakes, and ¾ inch in the wale strakes. The stringer plates, longitudinal framing, the armor shelf, and even the armor itself, will add immensely to the strength of the vessel, considered as a beam.

The serious and acknowledged weakness of ong ships, as customarily built, and which has been so often illustrated by their starting vertical seams amidships, and by the recent loss of everal iron steamers, make this great strength in advantage which will not be overlooked.

EFFECTIVENESS AS A STEAM RAM. The strength of general structure, the pecuiar construction of the bow, and the great power of the vessel, make it a very effective steam ram. Steaming at full speed, and striking another vessel at rest, the energy exerted claims made for the city and port, another ale

would be $E = \frac{WV^3}{2g} = 60,000$ foot-tons, nearly, or sufficient to raise the weight of the whole vessel ten feet. This is equal, in effect, to that of eight or nine 600-pound rifle, or six XX inch round shot, discharged simultaneously on the same spot. It is more than equal to the estimated energy of the projectiles of four of the proposed "81-ton rifles," recently designed at the British Admiralty. Such a blow would crush in even the armor plated sides of any iron clad yet constructed. The "handiness" of the vessel as already shown in a previous paragraph, gives a facility in manœuvering which is a most essential advantage in the 4 ram. "

MAGNETIC CHARACTER. The keel of the vessel lies in the east and

vest line. The iron in hull and machinery being of exceptionally good quality, it may be expected to exhibit but little permanent magneasm. Should the ship be removed from the dock to receive alterations or additions, the direction of her head would probably be reversed while the work goes on, and the deviations of the compass from local attraction would be reduced to a minimum.

States and abroad, is not, however, sufficient to justify the acceptance of either incon venience or danger to secure the benefit of it. and the difference now existing is gradually disappearing. The cost of the work required as stated, to complete hull and machinery, but not of armor or armament, will vary greatly with the character of material and workman ship, and with the nature of the plans adopted, where not already determined, by work already done. An approximate estimate may be taken as one hundred thousand dollars. To this is to be added the expense of removing the vessel from the dock. The expense of completing as an iron clad, fully armored and armed, has been estimated at about \$450,000.

Weight of Metal Plates, Per Square Foot.

IN POUNDS AND DECIMALS OF A POUND.

Thick.	Cast Iron.	Wrought Iron.	Copper.	Lead.	Brass.	Zinc.
In. 1-16. 3-16. 3-16. 3-16. 3-16. 3-16. 3-16. 3-16. 3-16. 3-16. 3-16. 3-16. 3-16. 3-16.	Lbs. 2:346 4:683 7:039 9:386 11:733 14:079 16:426 18:773 21:119 28:466 25:812 28:159 30:505 32:852 35:199 37:545	Lbs, 2:517 5:085 5:507 10:07 12:588 15:106 17:623 20:141 22:659 25:176 23:789 35:247 37:764 40:282	Lbs, 2-89 5-781 8-672 11-562 14-453 17-344 20-284 22-12k 26-016 28-906 81-797 40-46-9 43-359 46-25	Lbs. 8-691 7-389 11-074 14-765 22-148 25-839 29-53 33-222 36-913 40-604 44-296 47-897 51-678 55-37 59-061	Lbs. 2-675 5-35 8-025 10-7 13-375 16-05 18-725 21-4 24-075 39-425 32-1	Lbs, 2°34 4°68 7°02 9°36 11°7 14°04 16°34 18°72

More Philadelphia Steamships.

The Philadelphia North American says: After long deprivation of steam communication hence to Europe, a superior line of Philadelphia built iron steamships ply regularly to Liver-pool. So soon as they were built a Liverpool line competed for the trade that proved its Liverpool would be accomplished in 8 days, and magnitude by the effort to accomodate and enlarge it. That line was absorbed by the domestic to increase its own facilities. nounced in New York, as before, that the Philadelphia attempt must fail; and it was freely advertised at the West that our ships must gowere going-had gone to New York, drawn by the illimitable commercial advantages of that port and the proved incapacity of this. And now, seconding to authority, which by

our excellent cotemporary, the Evening Bulletin is deemed good, we are soon to witness the transfer of four of the finest ships of one of the greatest lines plying between New York the load line. The moment of stability, at a and Liverpool, to Philadelphia! The White Star Line finds, what we have repeatedly asserted, that the steamship business centering at New York is very much overdone and unremu nerative; and finds by those business calculations, business men make so rigid and try to sum and improve without bias, that the com merce of the present and future, places Philadelphia next to New York, and subtracts from New York to add to Philadelphia. Instead of New York drawing off the commerce of Philadelphia, Philadelphia sustains her own with noble justice, and draws that of New York to contribute to her increase.

We welcome the promised event. First of all things, and as an absolute essential to maintain the progress made, and therefore to seeure its continuance, we would have the American line of steamships sustained as it has been. Former hopes as brilliant as these, prospects as full of promise, have been blasted, and we have been left without an European steamship, either domestic or foreign, because the former were not supported when the latter ran. But there is business enough existing, and procurable to sustain all of these ships and many more. If the rumor shall prove true we shall have but fifteen regular steamships to Europe, averaging a departure every other day. This is indeed a century of progress compared with what was before the launch of the Pennsylvania, but it is nothing when proportioned to the busines our railroads to the South and West; our steamships along the southern coast; our man ufactures and general trade and growing power can sustain. It is another evidence of the to progress and welfare, that only need to be wisely used to become permanent and the cause of still greater advantage.

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On the Melting Point of Fusible Alloys.

The usual method of determining the melting point of lead and tin alloys has been to place the alloy in a small glass tube and heat it gradually in an oil bath. According to R. Grehm, slight inaccuracies result from this method, because the surface of the alloy be comes covered with a film of oxide, which fuses at a higher temperature, and renders the observation more difficult. Even if the glass tubes are sealed up errors may arise, bec the alloys soften and become pasty before they fuse, and their particles adhere to the glass and do not run together readily until a higher temperature is reached. In certain cases, as in alloys intended for

safety plugs in steam boilers, it is interesting to know the temperature at which they soften, as well as the melting point. Grehm accomplished this very easily in the following manner: The this very easily in the following manner: 12e alloy is drawn out, if possible, to a strong wire, otherwise it is rolled in thin plates, which are then cut into narrow strips. Two wires or strips are cleaned and bent into rings; one of these is suspended by a hook of iron wire, and the second suspended from this. Both rings are placed in an oil or parafine bath and warmed. As the rings soften they stretch into elipses, and finally become straight, but when the melting point is reached they fail to the bottom of the vessel. The following data were obtained in this way:

Alle	ys.	Softens	at o F.
Tin.	Lead.	at o F.	872
9	2	365	383
2	6	378	398
2	7	277%	406 to 410
2	8	39636	300 10 40

HENRY DISSTON & SONS,

Keystone Saw, Tool, Steel and File Works.

PHILADELPHIA.

Manufacturers of SHEET STEEL, and all Articles made from Sheet Steel.

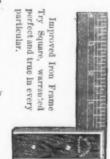
SAWS OF EVERY DESCRIPTION.

Also, FILES, TOOLS, Etc., and all kinds of Labor Saving Implements for keeping Saws in perfect order.



Hand Saw with adjustable handle. The thumb screws in the handle operate on the butt of the saw blade, and can be so adjusted as to give the blade any desired pitch.

Compass Saw, Keystone Tooth-it cuts with or across the grain with equal facility.



Patent adjustable Gauge Sawfor sawing tenons, kerfing, or any work where the cut is required to be of definite depth. Will pay for itself in one day. Try it and be convinced. Remove the gauge and use as an ordinary saw



Hack Saw. The blade in this Saw is reversible, an advantage which will be readily appreciated by mechanics.

READ, MARK,



LEARN.

We guarantee our Cross-Cut Saws to do more work, day in and day out, the season through, than any other saw in the market.

The test of practical experience has been ap-



plied, the verdict given, the flat has gone forth, and the Humbugs are fast fizzling out, while our rapidly increasing sales testify to the esti-



mation in which these saws are held.

We pledge ourselves that no effort shall be wanting to keep up the standard and reputation of our manufactures.



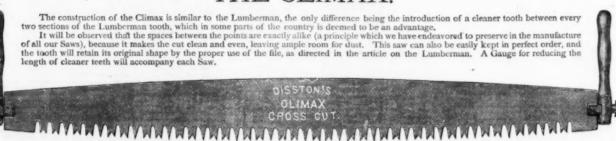
THE GREAT AMERICAN. In introducing this Saw to the trade, the manufacturers would remark that it has been subject to the most severe tests, which have determined the fact that it is one of the BEST CROSS-CUT SAWS ever offered to the public. The most important peculiarities of this Saw are as follows:— The outer teeth of each section are as sharp and effective cutting teeth as the teeth of a Rip Saw, while the middle or regulating tooth determines the extent of the out in proportion to the bevel of said tooth. The more you bevel the centre tooth, the faster the Saw cuts, whereas, if the centre tooth be filed square the Saw takes less hold on your log, and requires less muscle to drive it. Thus you can regulate your Saw to suit the strength of the parties working it. In using this improved Saw there is none of that "tearing of the wood, undue friction and drag," which in many other improved Crosscut Saws demand so much muscular exertion without a commensurate result. The manufacturers declare that there is no Cross-cut Saw in the market by which so much work can be done in ten hours, with so little exertion, as the "Great American Regulating Cross-cut." **OSSTOM** GREAT-AMERICAN** **ARGULATING** **REGULATING** **REGULAT

THE LUMBERMAN

Is greatly preferred in some sections of the country, and can be easily kept in order if filed according to directions, when so many of the fast-cutting Saws of the present day must lose their shape and cannot be kept in order.

In filing this Saw, the round edge mill file should be used, and by pressing a little downward as well as sideways you keep the tooth at all times in the same shape it leaves the factory. Attached to the Lumberman and Climax Saws will be found our new patent Cross-cut handle, which is at once the most simple and complete detachable handle now in use. Place the end of the saw blade into the slot in the casting, then drop the pin or rivet into its position, and a few turns of the wing nut secures the handle immovably to the Saw. Although the pin is quite loose when the handle is detached from the Saw, it is by a simple contrivance secured in its place, ready for use,—an advantage which will be fully appreciated by all lumbermen. We guarantee this handle to be superior to any in use.

THE CLIMAX.



THE NONPAREIL.

The Nonparell, of which the accompanying cut is a representation, is composed of sections of four cutting teeth, each section intersected by a cleaner tooth. It will be observed that the cavities on each side of the cleaner teeth are much larger and deeper than those of the cutting teeth, serving as a receptacle or chamber for dust, and effectually freeing the Saw during the operation of cutting. The cleaner teeth should always be kept shorter or lower than the cutting tooth. (The Gauge, as shown below, is made expressly for this purpose, and by its use the cleaner teeth of any Saw can be regulated and kept of exact length.)

This Saw has given unbounded satisfaction wherever it has been used, and we are constantly receiving orders for the same; in fact, in some sections, and for sawing soft lumber, it is preferred to any other Saw.

DISSTON'S NONPARELL SAW

Plain Truths for Practical Men.



We guarantee our Cross-Cut Saws to do more work, day in and day out, the season through, than any other saw in the market.

The test of practical experience has been ap-



plied, the verdict given, the fiat has gone forth, and the Humbugs are fast fizzling out, while our rapidly increasing sales testify to the es-



timation in which these saws are held.

We pledge ourselves that no effort shall be wanting to keep up the standard and reputation of our manufactures.



Gauge for Regulating Cleaning Teeth.

The cleaning teeth of all saws should be somewhat shorter than the cutting teeth, and, although shortened, they should be of uniform length throughout. The inner edge of the Gauge rests on the points of the cutting teeth, the cleaning teeth projecting through the opening in centre of Gauge. Reduce the projecting points, by means of a file, until arrested by the edges of the Gauge, which is made of hardened steel. Thus tooth after tooth can be rapidly and correctly reduced to an even length by any unskilled Operator.



New York Wholesale Prices, July 29, 1874.

HARDWARE.	-
Anvils. Solid Cast Steel. Wright's. P b gold 12c; over 230 bs 12%c, gold Armitage's Mouse Hole Wilkinson's. P b gold 11% Eagle Anvils, # b 11c currency. dis 15&10.	0100
Eagle Anvis. * b lie currency dis 15&10 taple Partrs. Turn Table. Lightning. Hudson's \$8.50 \(\) do: Keading.	
Reading Union Size Factor State Paring Coring and Slicing Size Size Paring Coring and Slicing Size Size Paring Coring and Slicing Size S	3 1810
Bay State Feach Parer. \$11 00 @ 11 56 Lightning 11 00 @ 11 57 Peach Stoner and Halver. 7 00 Augers and Bits.	-
Snell Mfg. Co	
Cushman's Expanding Hollow Augers dis 20,5 (1) Ives' Augers and Bits dis 30,8 (9) Gouge Lip Augers and Bits dis 30,8 (10) Hollow Augers dis 30,8 (10) Franchive Hollow Augers dis 30,8 (10) Expansive Hollow Augers dis 30,8 (10)	
Expansive Bits. dis 20x10 3 Andrew' Bits. dis 25 3 Clar's 4Expansive Bits. dis 15 5 Cook's Patent Augers dis 50 3 Bit 5 dis 40x10 3	
Shepardson's Double Cut Bits	
Light Ligh	
Watrous Ship Augers. dis 15 % Vanghan's 7 out Hole— 6 in. \$25 @; \$ in \$25 per doz. dis 20 % A xes.	
6 in. \$25 00; 9 in. \$25 per doz A x **9*8 Brook**	
Schweitzer Mig. Co. ii. ii. ii. ii. ii. ii. ii. ii. ii. i	
Double Bitted. # dox 21 50 60 20 to 60 20 20 20 20 20 20 20 20 20 20 20 20 20	-
Nobies Mfg. Co. S. B.	1
Morton's Bands Plated new list dis 30.85 % Plated new list dis 30.85 % Iron Rim new list dis 30.85 % Brass (Plated list) new list dis 50, 1082 % Oroide new list dis 50.865 %	1
3rass (Plated list)	1
Bells	
Revised Section Pevised Ist dis 05	1
Taylor's Patent Door Western Gong. revised list dis 50 5 Brook's Crank. revised list dis 50 5 Puil. revised list dis 50 5 Hart Mfg. Co., Crank and Puil. revised list dis 50 5 Cow - Common Wrought. dis 20 60 60 60 60 60 60 60 60 60 60 60 60 60	1
Blacksmiths'. dis 20 % Moulders' dis 15 %	1
Washburn's Patent. # gross \$11 00	1
Boardman's Patent, & in and larger P B S7 C	20 Me
## 42 c Carraage and Tire, Etna Nut Co. dis 60 g Stove, Etna Nut Co. dis 60 g Stove, Etna Nut Co. dis 1085 g Cast Iron Serrel, Shutter, &c. new list dis 608.10 g Wrought Iron Barrel new list dis 508.10 g Wrought Iron Fissh. dis 12 g Carraage and Tire, Common. dis 1086.00 g Star, Philadelphia, dis 50 g Star, Star, Philadelphia, dis 50 g Star,	E C
Star, Philadelphia	SHI
Carringe and Tire, it. B. & W	CAN
Stove	MAJSHVSH
Boring Machines. dis 15 %	J. VEE
Bow Pins. Union Nut Co., new list. dis 50&10	HEFGAT
Noble's Patent	M
Hung Hote Borers. dis 25 s Common add Ring. dis 25 s Enterorise Mig. Co. dis 30 s Ives' Tap Borers. dis 25 s Buckers' Cleavers. dis 25 s	OP
Humason & Bukley Mfg. Co	E
Hart Mfg. Co	
### ### ##############################	MEGO
Parliament dis 50&10	K
Parliament Gis 50 5	HPCT
Wronght Table and Back Flaps	TWNS
A. 8. Parker 8. Clark's Surface Billid Hingres, Nos. 1, 3 and 5 dis 50:45.5 Clark's Surface Billid Hingres, Nos. 1, 3 and 5 dis 50:45.10 4 No. 20 dis 50:45.10 4 Nos. 24, 45%, 6, 8, 10 dis 50:5 Seymour's dis 50:45.6 Nos. 27%	N
	M V
Ely's E. B	EHMC
Retailie	CVYMM
	HQ GV
Cattle Leaders—Union Nat Co., new inst. dis obs. 5: Chatas Engish Coil, by the cask # 5	WBH A
German Coli Lew list, Jan. 1, dis 10 \$ Jack Chain, Iron. us 50 \$	Si Fi
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	New York WI	1(
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CHA	Societ Firmers dis 60&10	% st id
W1 C3 C8	Spear & Jackson's \$3.50 to £ gold—new ii Clumps dis 43&10 Lumbers dis 43&10 Lumbers dis 20 Providence Tool Co. dis 10	
***	Norway or Best	K 252 35
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-	Cont Hous, Sinth, Burns 2 Co	2.
	Coni Hods. Smith, Surns & Co	NE %
	Brass Racking	20.20
	Coffee Mills.	****
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	Den: dis 35	***
-	Coopers' Tools. dis 15 @ 20 Bradley's dis 30 @ 25 Chas. E. Little dis 30 @ 25 Swan & Brombacher dis 15 @ 20 Coxtenesses dis 15 @ 20	AMMA
	Corn Knives and Cutters, Bradley's dis 10 Croquet. Phiness Smith. dis 40&1	0
	Phineas Smith dis 484: 1 **Trow Marrs. Cast Steel .	t c
	Carry Combs. Hotchkins' and Kellogg's, Iron and Brass	STATE OF
	Curtain Pins. Silvered Glass	1
	Cutiery, American Table	1 1 1
	10g Collars dis 15	6 1
-	" Co ppered " " 80 Silvered " 80 Challenge.— Japanned	0 2
	Appained	1
	Bradley's. dis 25 and dis 25 Adjustable Handled. dis 10 and 10 an	1
-	Dritis Ratchet dis 25 Ra	11.
	47 THE 188 ST.	
	American Drag Mills Kgg Benterss. Mouroe's	N
	Remery W B C C C C	N
	Sauce Pans, Glue Pots, &c	PE
	Brass Thread. dis 606:10	N
	Frary's Patent Fetroleum dis 10&10 % Taylor's Pattern dis 30&10 % Wood and Metallic dis 40 % Felloc Plates \$\psi\$ \$ 1 \$ \$\ma	NGU
	Nicholson	BR
	Walter Spencer & Co.'s "Diamond" 5 25 to £ gold	M
l	R. Ibbotson	B
	Fisher's	A
	"Philo Sheffield," P. T. Co. 5 00 to £ gold Floral Teols. dis 25 % Fluting Machines. Mrs. Coles, 7 Inch rolls	B
	Filing Sheffield, F. T. Co. 5 00 to \$ gold	M Bi
	Excelsion, No. 1. 475 each net No. 2. 650 each net Diamond 750 each net Climax 7-inch Rolls 800 each net	Y
-	" 4½" 6 50 each net Empire	G
	6-inch Roll. 6 00 each net Myers' Fashion Fluter, 4½ inch Rolls. 3 00 each net "Convex Brass Fluter, 8nd Iron attachment., \$175 Domestic Fluter. \$178 each net	88 80
	Fairy , Self-Heater . 8 00 each act Geneva Hand Fluter . \$15 00 per dor net Champion, 6 inch rolls . \$6 00 each dis 10 % 4 inch rolls . \$5 00 each dis 10 %	Pi Bi Si
н	Forges. "Europre" (W. P. Kellogg & Co.)	TIBINE
	Freezers. dis 40x5 @ 50x5 \(\) Freezers. dis 33\(\) Correy's dis 50\(\)	NXMP.
-	Freezers. Champion dis 83/ Torrey's dis 9/5 Fry Pans.—P. S. & W. Tinned dis 9/5 For 9/7 For 9/	H
	Gas Stoves. fift & Howard	H
	Grind Stones.	M
-	Hammers. Emmet Hammer Co	Pe
4-1	Mayaole's , new list. dis 5	N AN
-	Magnetic Tack. dis 248:10 % Haudies. dis 10 % Haudies. Hammer and Hatchet. dis 10 % Quakerfown, Axe, Pick and Sledge. dis 10 % Hammer and Hatchet. net	St Ti Pi
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17c 1 25 10 %	Tobles
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net	Try Squares and T Bevels
10 % 10 %	Full Weight American Iron
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10 % 50 %	Thermometers
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10 % 10 %	Disston's Plastering
25 × 30 ×	Brades' Brick
net	Garden,
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e c	See clist
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25	Pattern (Wrought)
50	Lindsay's Patent. dis 26. dis 26. dis 26. dis 26. dis 26. dis 26. Tat's Patern. dis 26. Davis' Patern Duplex. new list dis 25. Bernis & Call's Patent Combination dis 28.45 s. Wyringers.
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set	Monitor
55	TIN WARE AND TRIMMINGS.
00	STAMPED TIN WARE, dis 5 @ 10 f COMMON STAMPED WARE, &c Bucket Covers,
hic	Bucket Covers,

	Bucket Covers,
d	Quarts 36 1 2 3
d	Inch 434 53-16 65-16 636 711-
d	Per gross\$2.00 2.00 3.40 4.25 57
it	Quarts 6 8 10 12
ıt.	Inch 8% 9% 9% 10%
4	Done company and and and and and
8	Cake Box Covers.
2	Small. Medium. Large
2	Inch. Small. Medium. Large
2	Inch
20	Inch
8	
%	Inch 7% 8% 8% 9% 9% 109
8	Per gross \$5 75 600 625 635 725 12
ĸ	Inch 10% 11% 11% 12% 12% 13%
~	Inch 10% 11% 11% 12% 12% 13% 19% 19% 19% 19% 19% 13% 13% 13% 13% 13% 13% 13% 13% 13% 13
29	Pie, Dinner or Scolloped Plates.
2	Inch 6 7 8 9 10 11
~	Per gross
ń	Per gross
а	Inch. Deep Pie Plates.
	Per arros
K.	
%	
-	Inch
2	Per gross
5	Coffee Pot Covers.
5	Plain 136 2 2 4 5 6 054
2	Inch
2	Per gross \$1.15 1.40 1.60 200 275 50
î	Rimmed 2% 8 3% 4 4% inches.
5	Per gross \$2 25 2 50 8 00 8 50 4 00
e	T. K. Breasts only. Inch 7½ 8 8½ 9 9½ 10 10½ 11 11½
70	Inch 7)4 8 84 9 94 10 104 11 114 Per gro. 86 00 6 30 6 75 7 25 7 25 9 50 10 00 12 00 12 10
8.	Per gro.\$600 6:50 6:75 7:25 7:75 9:50 10:00 12:00 12:00
	Grater Plates.
٠.	Per gross
6	
١,	Scotloped Cake Pans.
6	
6	With Tubesper gross, \$8:00 112 With Tubes
E	With Tubes 10:50
6	Stamped Square Pane
ı,	MU %
E	Per gross
- 1	Common Square Pans (One Sheet).
. 1	Per gross. Milk Skimmers (Plain or Pierced). Per gross.
9 (Milk Skimmers (Plain or Pierced).
6	Per gross
6 1	
	Inch 5½
ы	Per gross \$945
	Steamer Bottoms.
9	Add \$1 per gross, or ite. per doz. to list of Pot Cover. Tin Stove Pipe Rings.
ы	Tin Stove Pipe Rings.
1	Inch 4 4% 5 5%
- 1	
E	Jap'd or Bura'd 600 630 700 800 850 10
6 1	Coffee Botley Vine
i i	Small
iί	To Rivet per gross, \$0.80
t l	
	Plain Managed Water Dispers
اۃ	Plain Stamped Water Dippers. Aphit. Plat. Quart. 2 quarts. 2% quart. Per dos 90 1-15 1-50 1-65 1-65 1-65 1-65 1-65 1-65 1-65 1-65
Н	Per dos '90 1'15 1'50 1'65 1'9
П	RETINNNED WARE, die 20 @ 25 %.
١.	Retinned Milk Pans. Q18 1 1 1 2 8 8 8 4 5 6 8 1 1 4 6 0 1 1 1 1 1 2 8 8 8 4 4 5 6 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
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81	Pints 1 Quarts 175 I
	PintsX 1 Quarts 100 125 1 Per dos 100 125 1 Pur dos 100 125 1 Dipper Bowls, Retinged
1	Dipper Bowls, Retinned
1	Per doz 3 1 195 Per doz 110 175 2
1	Per dos. 25 26 105 Per dos 1 10 125
1	Pans. Dish Pans. Tinneddis 20 6 2
1	Pans. Dish Pans. Tinned. Quarts
. 1	Per dor. 8-50 9-50 11-00 19-00 16-00 19-00 37
1	Fer 407 8-50 9-50 11-00 15-00 15-00 15-00
1	
1	Cannisters, Common
1	Pound
1	Per doz
	Capisters, Hipsed
1	
1	Pound
1	Candlesticks, Japanned

July 30, 1874.	<u></u>
Lunch Boxes, per doz 7 in \$2 00 , 8 in. \$2 50 ; dis 10 g Pepper Boxes Japannod dis 10 g Per gross dis 10 g Toy Banks, House dis 10 g Tog Banks, House dis 10 g Tog Banks, House dis 10 g Tog Trays, American Tea Tray Co dis 10 g Tog Banks Gothic dis 10 g Per gross \$5 00	No. 29
Per gross. Toy Cups. FiaringNo. i, \$4'-25'; 2, \$8'70' 34 gross, dis 10'; Toy Palls, Covered	### TUBLING (Brown & Sharpe's Gauge.) Plain to No. 20, inclusive
Each	Tubing sawed or cut 2 to 4 ft. long, 2c. advance on List. Add to two cents a half-cent for each additional cutting under two feet. 10 % discount. BRASS DOOR HALL—48 cents per 1b.—10 % dis. BELT AND HOSE COPPER RIVERS AND BURS., dis. 25 %.
Planished Round Coffee Biggtins	10 " " " 1.750 1.25 15 " " 1.750 1.25 13 " " " 1.750 1.755 13 " " " 1.750 1.755 14 " " 1.750 1.755 15 " " 1.750 1.755 16 " " 1.750 1.755 17 " 1.750 1.755 18 " 1.750 1.755 19 " 1.755 19 " 1.755
Fints	Chips, half the price of Scrap.
Nos.	American Ingot. \$\psi\$ 26 \(\psi\$ 28\) (c English SHEATHING. BRAZIEES COPPER. BOLTS. 40. Braziers Copper, ordinary sizes, over 16 0.2., per aquare 1006. Braziers Copper, ordinary sizes, 16 0.2. and over 12 0.2. ger aquare foot and lighter. 41c. September 12 0.2. ger aquare foot and lighter. 41c. Circles 162 41 date 162 dat
Stow's Patent Hollow Tea Pot Handles. No. 1, Small 41/4 inches	No Copper is Sheathing except 14x48 inches, and not to exceed \$6 oz. to the square foot. #INSTERM. \$6. \Pi sheet 14x48, by the case. 10c. 14x48, by the case. 10c. 14x48, less than case. 10c. 12c. 14x48, less than case. 10c. 12c. 12c. 12c. 12c. 12c. 12c. 12c. 12
No. 25, Small, 4% inches	14 and 16 oz and heavier the By the case the to
No. 12. Bronzed and Tin-Tippedper gross, \$13-50 {sascapen Handles. Or lies katicate kron.	14 and 16 or. and heavier
No. 45, Large, 80 id Iron, Tin Tipped. No. 10, 8mall, 4% inches	per lb.: Plue and Sheet, 3% cents per lb. All subject to a reduction of 10 per cent. Spanish. 6% 6 6% c gold German Refined. 6% 66% c gold English. 6% 67 c gold American.
IRON.—DUTY: Bars, 1 to 1% cents per lb., Sheet, Band, Hoop and Scroil, 1% to 1% cents per lb. Provided, that none of the above 1 ron shall nay a sees rate of duty than 35 per cent. Pig. 87 por ton; Polished Sheets, 3 cents per lb.; Wrought Scrap, 86 per ton. All subject to a reduction of 10 per cent. Railroad, 70 cents per 100 lbs. Boiler and Plate, 130 Pig 170m—AMERICAN.	Tool
Foundary No. 4. 29 10 ca 3 0 00 Grsy Forge. 27 00 © 28 (0 White and Mottled. SCOTCH. Cottness. 40 00 Glengarnock. 33 00 © 33 50 Summerice. 38 00 © 33 50 Market Pers. 40 00 Glengarnock. 40 00 Market Pers. 40 00 Market Pers	Homogeneous
Weisi, gold	Swaged, Cast
Nicet Iren. Common R. G. R. G.	### Steet, Flat and % todam. 12%c ### 12%c #### 12%c #### 13%c #### 13%c #### 13%c ##### 13%c ###################################
Patent Pollahed	Manufactures of, not enumerated, 25 per cent. ad val.
BARBITT METAL.	C 10x14, Prime Charcoal TIN PLATE. 11 75 @ 12:00 2x12,
All Brass thinner than No. 28 is Platers' Brass at	TRENE PLATE. Prime Char. 2d cusl. Coke. I C 14x30\$14x30
Circular sheets, in diam. from 4 in. to 14 inclusive. 44c over 14 in. to 30 45c	Paper Stock, Old Metals, &c. Canvas linen. (Dealers' Solling Prices.) Convas linen. 65 6 7 White linen rass, No. 1. 65 7
"I in. and over	Pixed woolens.
Algh Brass Scrap, 17 cents, net. Low 19 Glidreg, 21 cents, net. Turnings, Filings and Chips, half the price of Scrap act BRASS AND COPPER WIRE (Stub's Wire Gauge). Glid's and	Grass rope No. 2
No. 0 to 70	Canvas linen

1	Copper Old Metal. 21 22
	Copper 21
	Yellow flietal. 14 Brass
	Sheet Iron
	Machinery iron.
	Pewter, No. 1
	•
3	Paints, Oils, etc.
5	Black, lamp—Coach Painters P B 20c
1	" lvory Drop, fair
	Blue, Prussian, fair to best
	Chinese, dry. 88c
	* Van Dyke
	Green. Chrome
	in oil. 30c 45c
	Red Lead, American
	Venetian (N. C.) dry
	Rose Pink
	" Rurot
	Umber, Barnt
	** Raw
	** English
	White Let d, American, pure dry
	" Indian, dry Senae Pink Senae American, Enw
	Vermont in casks 11/c Chrome 17 @ 2/c
1	Zinc White, American No. 1 dry
	Freach (Paris)
	Linseed Raw gal. caaks, 87c. bbis. 88c
,	** Bleached Winter
	Sperm, Crude. "1% "Winter unbleached. "185 "Winter unbleached. "186
	Lard, Pure Winter
	Cotton Seed, Crude. ** 60c Southern Yellow ** 65c
	Sorting Cotton Sect. Crude. 60c Southern Yellow 60c White. 70c @ \$1'10 Neastook, Winter 70c @ \$1'10 Natural Labricating 38cg 44C Asphaltum 50c Asphaltum 50c
,	Chalk
	Flocks. English
	Frostings. 50e Glue, White 33 4 fc " Sheet 32 4 fc
1	Glaziers' Points, Zinc
	Shellac, English. 60e
	Punice Stone, selected Lumps
	Putty in bladders
-	Spirits Turpeatine
	Frontings
20 24 20	18 x 22 to 20 x 30
	15 x 36 to 24 x 30. 17:50 15:25 19:30 26 x 38 to 34 x 36. 18:25 16:00 18:25 26 x 38 to 36 x 44. 20:00 18:00 14:50
	26 x 46 to 30 x 50. 21 0 19 0 15 25 90 x 52 to 30 x 54. 22 50 32 x 54. 22 50 32 5 19 00
***	36 x 60 to 40 x 60
	DOUBLE.
1	6 x 8 to 10 x 15
1	11 x 14 to 16 x 24. 19:25 17:25 16:00 19:25 18 x 22 to 30 x 30. 24:00 21:25 19:25 15 x 36 to 24 x 30. 24:00 24:25 19:25
	13 x 22 to 30 x 30.
	30 x 52 to 30 x 54.
	30 X 00 to 90 X 00 40 to 43 25 (30 25)
*	An additional 10 per cent, will be charged for all (times more than 40 inches wide. All sizes above \$2 inches in length, and not making more than according to the control of the control
	Sizes above—\$12-00 per box extra for every 5 inches. An additional 10 per cent, will be charged for all (till se more than 40 inches wide. All sizes above 22 inches in length, and not making more than 31 anized inches, will be charged in the 81 united inches bracket. Discounts 302-10 4 302-15 4.
	A. C. Downing & Comp'y.
)	J. Donning & bomp y,

Francis Dougherty

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H. CARTER,

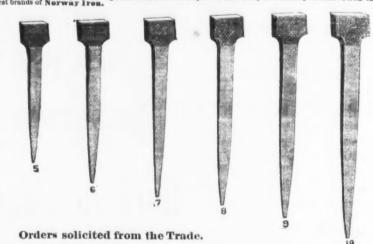


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WRENCHES, Worcester, Mass.

Our Mr. L. Coes, formerly senior mem-ber of the firm of L. & A. G. Coes, established in 1839, is the Original Inventor of the Screw Wrench, and has, by making the bar wider, where th strain comes most severe, and screwing a nut up firmly against iour square shoulders inside the ferrule, thereby effectually preventing the ferrule from being thrust back into the handle or getting loose, and making a larger screw than in the old wrench, fully succeeded in making a 12 inch wrench stronger than a 15 inch made in the usual manner. All sizes are made in this way, and are undoubtedly the strongest and best finished Screw Wrenches in the There ar Imitations of our zoods offered for

sale, that, without question, infringe on Patents.

We hold Patents bearing date Nov. 16th,

1833 (re-issued June 1st, 1869). June 26th 1866, March 23d. 1869 (re-issued April 12th, 1870, and May 14th, 1872), which fully cover all our improvements. One of the above cuts represents a sectional view, showing the nut under the ferrule, and the strengthened bar, that part being covered by the aw, as seen in the cut of wrench complete. None genuine unless

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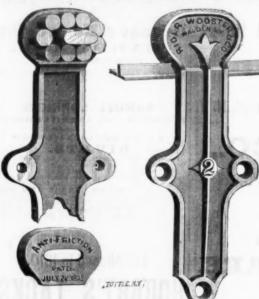
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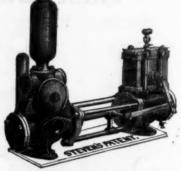
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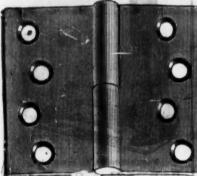
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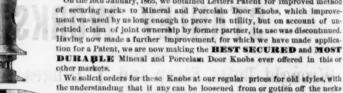


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Picks,—Philadelphia	Sheet 18 Cor 24 Co
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and Sharpened. F doz. \$11.00 net Clipper No. 16, Boxed and Sharpened. F doz. \$10.50	I.C.
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McNiece's H'd, Cross-Cut & Circ'r, new list dis 12 & Boyuton's Leavest and the control of Leavest and	Lead. Coppe ingot
Shovels and Spades. Rowland's Plain Back, list Feb. 1873dis 20&10 ©	Sheat
Oliver Ames & Sons	Zinc. Case,
Coquanock (polished face), per lb. 4%c. net coquanock (polished face)	Brass Roll,
190 190	Babbi
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Screws, -1ronnew list, Jan. 1st, 1874, dis 824, 5 Brass	Sheet lros
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Coes Inflation Wought Bar. dis 50 5 10 5 10 5 10 5 10 5 10 5 10 5 10	3-inch
No. 21 to 36, dis 45 of 47 \(\)	The follow Phillips, H. I Iron, standa card rate, 2
Revorted by Mannes. Sidney Shepard & Co. July 25, 1874.	Iron Wedge Norway Nai Crow Bars (("Wedge" Beetle Ring Fence Picke % round, b
Augers—Snell Mfg. Co. dis 20 s	net. Carriage and Plow Bolta. Solve Bolta. Machine and Lagit Ends. Pas. Hot Presmall sizes washers, all sizes washers, all samall sizes washers, all sizes washers,
Case lots	Wagon and Double Tree Coupling Tongue Neck Yoke Tongue Cap Band Iron Wagon Chai net. 4 in
Rope—Manlis, \(\) inch and larger \(\psi \) is \(\) is \(\psi \) income \(\	Tin Pinte 10 10 10 10 10 10 10 10 10 10 10 10 10 1
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Tunied	A. P
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	Am Russia A F h 16c	
	4-inch. 2 00 4 35-inch. 8 2 50 Sheet Iron Brend Pans 4 2 10c American Broilers 9 dox, 812-00 Timself on achines dis 5 5 Sad Irons. 9 9 4 c Brass Rettles.—Ansonis. 32c	
	PITTSBURGH. The following are the Card rates of Lewis, Oliver &	
	Phillips, H. B. Newhall, 11 Warren St., New York, Agent. Iron, standard list assorted sizes, for large orders, 2c, card rate, 2 % off net. Plat Rall (1/4x\(\)), punched and coun'sunk. 44c \$\mathbb{B}\$ net Iron Wedges	
	net, Carriage and Tire Bolts (new list)	
	Flow Bolts	
	1 in. diam. See w m met 3. % in. diam. See w m met; 1 in. diam. See w m met 3. % in. diam. See w m met; Patent Hended Barrow Teeth, packed in casks, see w m exiskein Botte, in bulk, in lots of 1 keg or m.ore, s. in. diam. 5% w m not; 9-16 in. diam. 6% e w m exis si in. diam. 7% w m not; 9-16 in. diam. 6% e w m exis si in. diam. 7% w m exis si ordered. Serew Hook-and-Eye Hinges, % to 1 in. diam. 9e w m	
-	7½c ♥ B net. Ic ♥ B extra when less than 1 keg of each size is ordered. Screw Hook-and-Eye Hinges, % to 1 in. diam. 9c ♥ B net; % in. diam. 10c ♥ B net; % in. diam. 12 c ♥ B net. Serew and Stran Hinges, in lots of 100 pairs or more, 14 to 5 th. 10ng, 5½c ♥ B abet; 8, to 4 2 2 in. long, 6½c ♥ B net Strap and T Hinges	
	Duck Nest Tuyere Irons	,
	Wagon Box Strap Bolts-	ŀ
	10 in. long by 7-16 at Screw End, \$\Phi\$ set of 8 bolts 55c 18 70c 10 49.16 8 70c 19 90c	ı
	14 " 9-16 " " 8 " \$1 00	ı
	14 " % " " 8 " 110 16 " % " " 8 " 120	ı
	5c w set for each additional inch over 14 in. All lengths made. In ordering Box Strap Boits please give diameter at	
	Screw End. Wagon Box Rods, narrow track, each. 18c Wagon Box Rods, narrow track, each. 30c Single Tree Irons, # set of four pieces. 38c Wrought Iron Boister Plates, 23 in, wide, # set. 60c Screw End. Screw End. Wagon Box	4
1	Wagon Brake Ratchets, each	
	Double and Single Tree Clips, figure 1, each. 9 c	
	Brake Eatchets, Hammer Straps, Rub Irons, Stay Chain Hooks and Clips, in lots of 50 sers. Wagon Box Staples, 13 to 3% in. to clinch. \$1000 \$11 00 net Neck Yoke Eyes, each. \$1000 \$100 for net Neck Yoke Eyes, each. \$2c net King Bolts, \$6, 1, 1%, and 1% in. dam. \$5 b 4%; net Wagon Rivets, ex. large, flat, oval and skeeple head, \$6 in. dam. \$8% one	
-	Ning Boits, §, 1. 1%, and 1% in diam. Wagon Rivets, ex. larger, that, oval and steeple head, § in, diam, all lengths. Wagon Rivets, Pelon, diam, all lengths. Wagon Rivets, Pelon, diam, all lengths. See extra wagon Rivets, Pelon, and See extra lengths. Wagon Rivets, Pelon, See extra lengths. See extra lengths. See extra lengths. Boushe Tee, Plates. Self in. Boushe Tee, Plates. Self in. Boushe Tee, Plates. We have and self in the lengths. Boushe Tee, Plates. Self in. Boushe Tee, Plates. Boushe Tee, Pla	
	Complete And American	
	Tongue 5% c net Tongue 9 c net Neck Yoke Plates 11 c net Tongue Cap Iron, 1½, 2 & 2½ in. wide, same price à 1b as Band Iron. Wagon Chains, Stay Lock and Tongue, 5-16 in. 3 1b 10½c net. ¼ in., 11½c. net	
	Reported by Mesers, Jewett & Root.)	1
-	Tile Plate,	
-	IC 14x20 13 59 Tinning # sheet, 14x8s ide IX 14x20 16 25	
	DXXX 100 Plate 28:00 Born No. 1 19c DXXXX 100 Plate 28:00 No. 2 18:10 No. 1 19c X, 14x14 24:00 Bright Wive dis 57% 2 16, 10x14 W. 12:00 Sheet Iron.	
-	1	

Band Iron.	nd Tongue, 5-16 in, P B 10%
1	ROIT.
(Reported by Menn	
Tin Plate.—Best Charcoal	Copper Bottoms85c
IC, 10x14	Planished Copper.
IX, 10x14, 15 :5	Sheathing, 14x4841c
XX.10x14	Boiler Size, No. 7 43c
IC, 12x12 18 00	4 No. 8 48c
IX, 12x12 15 75	" No. 9 48e
IC, 14x20 13 59	Tipp for 10 choose 4 An Ac the
IX, 14x20 16 25	** ** ** ** ** 9 16c
XX,14x20	" 814e
XXX, 14x30 21 75	9 16c
XXXX, 14x20 24 50	Lang Lange
DC, 100 Plate 12 00	Large Pign
DY 4 14 15	Small Pigs 88c
DX. 1475 DXX. 1750 DXXX 2 1750	Solder,—No. 1 19c
DXXXX 100 Plate 28 00	No. 2 180
IX, 14x14 24 50	Bright Wire dis 5714 %
1C, 10x14 W 12 00	Sheet Iron.
IX. 10x14 W 14 75	No. 18 Am. Com 5 50
Roofing Tin Best Char.	Pat. Am. Russia "A.
IC, Terne, 14x20\$11 80	Pat. Am. Russia "A."
IX, " 14x20 14 25	Nos. 24, 25 & 26 1434c
IC. Terne, 20x28 23 00	Russia, Nos. 9, 10, 11 & 12.21c
1X, 20x28 25 50	Pat. Planished Russia c
Coke Tin.— IC, 10x14 Coke, \$10 50	Russia No. 9. 10, 11&12 c
IX, 10x14, Coke 18 20	TROW.
IC, 14x20, "	Nos. 15 to 20 Smooth \$6 10
Sheet Zinc.	4 21 to 24
Any width	* 25 & 26 6 (4)
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Sheathing33c	" 25 & 26 9 8 00
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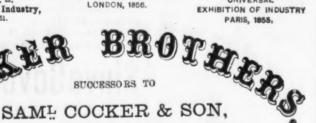
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Mort4, [C, "	18.00	D. X.
Mort4, [C, "	18.00	D. X.
Mort4, [C, Charcoal	Best	DXX
Mort5, [C, Charcoal	Best	DXX
Mort5, [C, Charcoal	Best	DXX
Mort5, [C, Charcoal	Best	DXX
Mort5, [C, Charcoal	Best	DXX
Mort5, [C, Charcoal	Best	DXX
Mort5, [C, Charcoal	Best	DXX
Mort5, [C, Charcoal	Best	DXX
Mort5, [C, Charcoal	Best	DXX
Mort5, [C, Charcoal	Best	British
Mort5, [C, Charcoal	Best	British
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| Broad. | dis 30 g| | Chain. | Eug. Coll. 3-16 | \(\frac{1}{2} \) | 5-16 | \(\frac{1}{2} \) | 7-16 | \(\frac{1}{2} \) | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16 | 7-16

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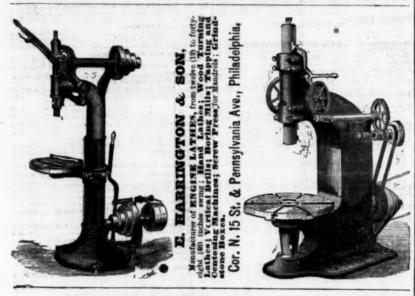
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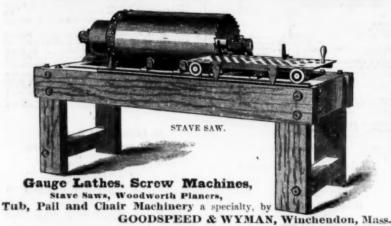


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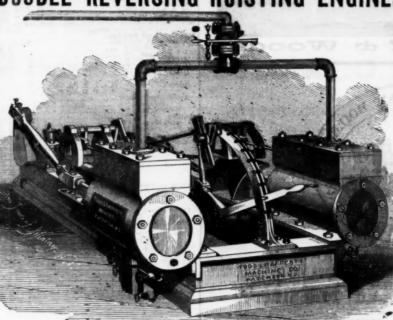
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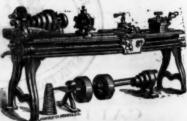
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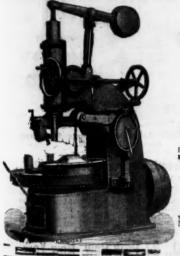
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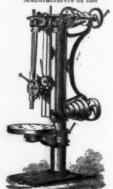
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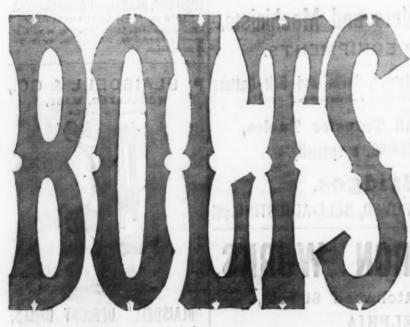
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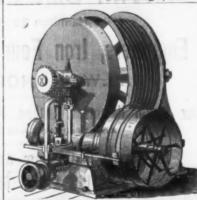
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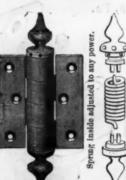
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